The Mining Journal

London, June 9, 1961

In this issue . . .

Helping India to Help Herself	649
Stockpiling Headaches for Uncle Sam ...	651
Japan's Non-Ferrous Metal Imports ...	653
Coal Research in the United States ...	653
The ECAFE Countries in 1960	654
New Markets for Lead	655
Digital Decking Device for Mine Winders	657
Developments in the Valuation of Gold Mining Properties from Borehole Results—II	658
Mining Miscellany	662
Machinery and Equipment	665
Professional Directory	666
Metals and Minerals	669
London Metal and Ores Prices	669
Mining Finance	671
Company Announcement	672
Company Meetings	676

Vol. 256 **No. 6564**

Established 1835

Editor
U. Baliol Scott
Deputy Editor
A. Graham Thomson
Assistant Editor
R. Bowran

Display Advertisement Manager
E. S. Hooper

Circulation
Robert Budd

Published each Friday by
THE MINING JOURNAL LTD.

Directors
E. Baliol Scott (*Chairman*) — U. Baliol Scott (*Managing*)
G. A. Baliol Scott — R. A. Ellefsen

15 WILSON STREET, LONDON, E.C.2

Telegraphic Tutwork London
Telephone MONarch 2567 (3 lines)

Annual Subscription £3 15s. Single copy ninepence

Helping India to Help Herself

INDIA'S third five year plan, launched in April this year, calls for an expenditure of Rs. 118,000,000,000 (£8,850,000,000), of which Rs. 75,000,000,000 will be spent by the government and Rs. 43,000,000,000 by private industry. Final targets have just been announced by the National Development Council. This is the most ambitious programme of economic and social development which India has embarked upon since independence. It envisages an annual increase of five to six per cent in the national income, the expansion of heavy industry, and free compulsory education between the ages of six and fourteen. Production of food is to rise from 75,000,000 to 100,000,000 tons by 1966 and steel production from 6,000,000 to 10,000,000 tons.

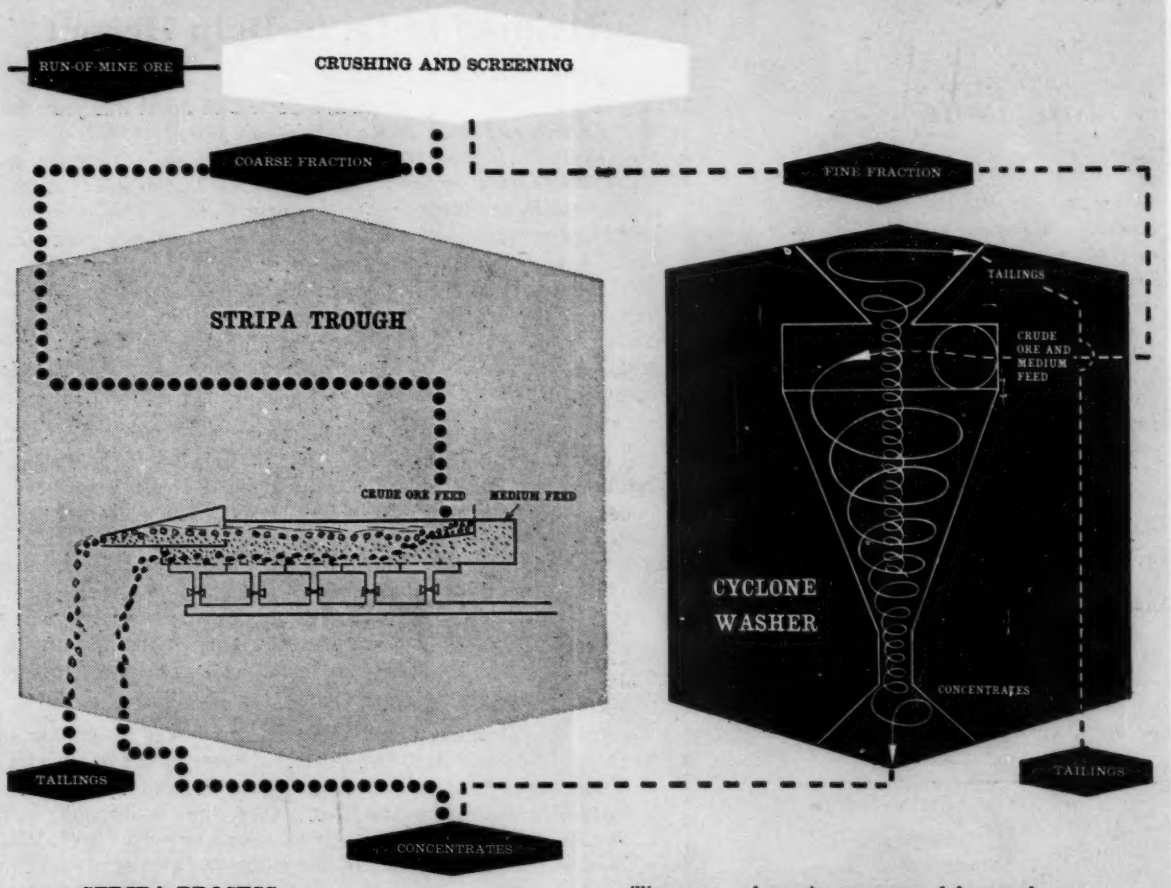
The plan is expected to provide from 16,000,000 to 17,000,000 additional jobs, but this will still leave a backlog of 9,000,000 unemployed in 1966. Moreover, the Indian annual income per head of population is currently rather less than £25; having regard to the growing pressure of population it is unlikely to reach more than £27 by the end of the plan. In the light of these grim figures there can be little doubt that the success of the plan is of critical importance not only to India herself but to the Western world. Otherwise this vast country, which is the natural leader of the uncommitted nations, must inevitably become increasingly susceptible to Communist influence.

In political significance, therefore, as well as in magnitude, the financing of India's third five year plan presents the West with a challenge which it can ill afford to ignore. According to her own assessment, between now and March, 1966, India will require some £1,964,300,000 in foreign aid. At a meeting which took place in Washington early this month, the aid to India consortium of the advanced industrial nations has undertaken total commitments of £794,600,000 in the first two years of the plan, which, it is hoped, will cover the prospective balance of payments deficit during this period and allow advance orders to be placed for subsequent years. The U.S. has offered £373,200,000 in the first two years, together with £464,300,000 in surplus commodities which will be made available during the plan. The U.K.'s commitment totals £89,300,000 of which £65,000,000 represents the contribution for the year ending next March.

In accordance with American determination that the aid burden should be more widely shared, the U.S. hopes that its 1962-63 obligation of £178,571,000 will be matched by other countries. The World Bank and the International Development Agency have committed £53,600,000 for that year and some £89,300,000 for the current one, while Canada, France, Germany, Japan and the U.K. have committed £100,000,000 for next year. France has offered £5,300,000 in each of the next two years. The West German commitment, which has been increased, comprises £80,000,000 this year and £49,643,000 next year, with a further £21,785,000 to be provided in the third year of the plan as part of the Rourkela steelworks project. All commitments are subject to legislative action by the countries concerned.

DENSITY SEPARATION?

always accurate—treats any mineral



STRIPA PROCESS

High capacity rating at a low capital and operating cost.
Simple medium reclamation circuits with small losses due to coarse particle size of medium solids.
Closely sized feed not required.
Wide choice of medium solids due to possibility of using autogenous material.

CYCLONE WASHER PROCESS

Dense-medium separation efficiency obtainable in small particle size range.
Compact plant of high capacity.

Accurate separation at low cost allows a reduction in milling costs and permits treatment of low grade ores, minerals of sub-economic value, refuse products etc., which have not been able to stand treatment costs of more elaborate plants.

Use of either process or a combination provides effective and economical plant for density separations over a wide range of feed size.

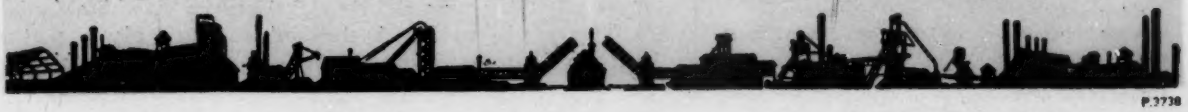
Testing facilities and the wide resources of the Head Wrightson organisation are available for the design and construction of units or complete mineral engineering plants.

Write to us now for details of our mineral separation processes.

HEAD WRIGHTSON MINERALS ENGINEERING LTD

46 RUTLAND PARK SHEFFIELD *TEESDALE IRON WORKS THORNABY*

LONDON · JOHANNESBURG · SYDNEY · CALCUTTA



P.3738

The U.S. hopes that by the end of this year India will have been pledged sufficient aid to cover about half her estimated foreign exchange needs throughout the whole plan period. Meanwhile, the consortium's commitments are already large enough to allow the plan to be launched with confidence. Creditors are being urged to make their loans on the easiest possible terms, the possibility of 50-year advances at low rates of interest being envisaged.

Even if India does not secure the whole of the sum needed to finance the foreign exchange needs of the plan, present indications suggest that of all the underdeveloped countries she will be the largest recipient of aid and constructive investment during the next five years; hence she is likely to be one of the most promising export markets for the industrial countries. In view of the basic dependence of industrial expansion on minerals and metals, it is evident that the plan will involve heavy expenditure on mining machinery and equipment. Of the total outlay of Rs. 25,000,000,000 envisaged for industrial and mineral programmes, metallurgical and engineering industries have been allocated Rs. 12,000,000,000 and mineral industries Rs. 4,050,000,000. There will also be a heavy expenditure on imported metals, in which connection it is noteworthy that a few months ago the Development Loan Fund in Washington was approached for a loan of $20,000,000 to buy copper, zinc and aluminium. DLF funds carry clauses requiring that the money be spent only in the United States. Indeed, virtually all American aid will be tied to U.S. purchases. On the other hand, the German government has recently made some funds available in untied form. The Indian government is known to dislike "strings" and in view of its low reserves the country's need for untied funds is very great. On the other hand, the state of the U.S. balance of payments imposes limitations on America's freedom of action and the same consideration applies no less forcefully to the United Kingdom.

In the absence of "strings" there can, of course, be no assurance that trade will follow our own aid flag. Hence the closest possible liaison between those concerned with administering our aid programme and those in a position to supply technical know-how and equipment is essential.

Despite the enormous sums being made available as a result of the Washington talks, financial and technical assistance to India is far from being a Western monopoly. In accordance with her neutralist and uncommitted tradition, India is prepared to accept aid from any source, provided the projects conform to the requirements of the plan and the necessary credit facilities are offered on suitable terms. An agreement signed early this year brought Soviet assistance to India since 1955 to Rs. 3,854,100,000 (about £275,000,000). According to *Soviet News*, 26 industrial and power projects will be built in India with Soviet technical assistance under the third five-year plan. This number does not include the Bhilai steel mill, the capacity of which is to be increased to 2,500,000 tons of steel ingots per annum within the next five years. Over 30 per cent of all the power stations to be put into operation in India under the third five-year plan are being or will be built with Soviet assistance. A plant for processing some 2,000,000 tons of crude oil annually will be built in Gujarat State with Soviet assistance. Oil and gas prospecting and extraction are continuing with the help of Soviet specialists. A heavy machinery plant is being built near Ranchi in accordance with Soviet plans and will produce equipment for the metallurgical industry. A mining equipment plant is also under construction. A refractory plant near Bhilai for the production of about 125,000 tons of magnesite and fireclay products annually is being financed by Russia. Soviet specialists will assist in the development of the coal industry, a major project being a 3,000,000 ton coal washing plant at Kathara in Bihar.

The rate of interest for all Soviet credits is 2½ per cent. Repayments, in rupees, begin after the delivery of machinery and equipment supplied against credits completed and are spread over 12 years.

So far as private investment is concerned, it is noteworthy that in recent months India's approach to industrial planning has become more flexible and much less doctrinaire. It was recognized last year that only by allowing the private sector to expand could the country be provided with all the coal it needed. The importance of private investment is now fully realized and the government has made it clear that it has no intention of extending the public sector through nationalization during the third plan period. Moreover, a number of tax anomalies which discriminated between Indian owned and jointly Indian and foreign owned companies have been removed. In the original estimate for the third five-year plan investment in the private sector was placed at £1,800,000,000, but the figure was subsequently raised to £2,500,000,000. The original estimate for the third five-year plan increases it further to some £3,000,000,000. The figures are encouraging pointers to the changing status of private enterprise in India's economic plans.

STOCKPILING HEADACHES FOR UNCLE SAM

Some of the physical problems associated with America's stupendous stockpile of strategic minerals and metals are spotlighted in a recent issue of *American Metal Market*. So far the stockpile has set the taxpayer back more than $15,000,000,000, states our contemporary, but he's not yet finished paying for this hoard.

Storage and upgrading these materials for use today is developing into a pressing government problem and, in addition, the kind of emergency anticipated ten years ago is not the kind of emergency anticipated today.

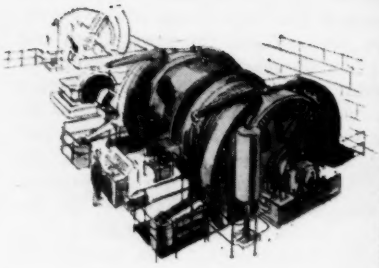
In some cases sub-standard containers must be scrapped and new ones substituted. Some materials must be moved to new open-area storage sites just to prevent "earth contamination". Protective coverings must be erected to shelter piles of ore and metal from weathering.

During the second half of 1960 132 new preservation and maintenance projects were initiated and 186 similar projects previously authorized were completed

Storage of acid-grade fluorspar has been a tricky problem. The powdery material is subject to wind and water erosion. Four new acid-grade fluorspar storage areas were established during 1960 near the Mexican border for new fluorspar taken by the U.S. in barter exchange with Mexico. Though the maximum for stockpiling has been reached in fluorspar, some additional acid-grade material is still being taken on barter agreements with other nations in exchange for U.S. surplus farm products.

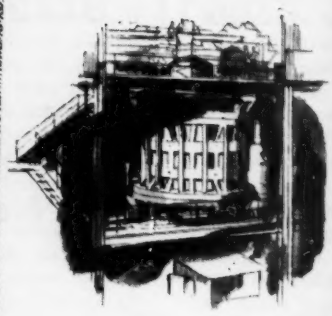
Aluminium and bauxite have cost the stockpile more money than any other item, a total of $504,000,000. This is mainly because DPA expansion contracts during the 1950's required the U.S. to buy unsold production from the expanded facilities. In the last six months of 1960 the stockpile bought $5,000,000 worth of aluminium and its ores and $4,000,000 worth of manganese on such expansion contracts, although these items have been over-subscribed for many years. Tungsten, still one of the most expensive items in the stockpile at a cost of $341,000,000, is a prime example of overstocking. Titanium is yet another item which may never be used. This pile cost Uncle Sam $328,000,000, and most of it is in a form that must be up-graded at a high cost before it can even be considered for working into metal.

NORDBERG MINING MACHINERY



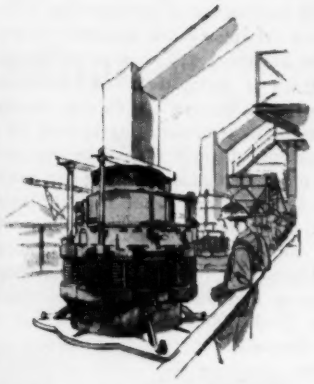
FOR HOISTING

Nordberg has an established reputation second to none, and can furnish both conventional and friction type mine hoists for men and material, to meet specific requirements.



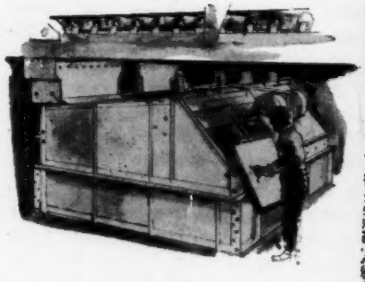
FOR PRIMARY CRUSHING

Symons® Primary Gyratory Crushers are built for big tonnage, heavy duty primary breaking in 30", 42" 48", 54", 60", and 72" feed opening sizes. Capacities to 3500 or more tons per hour.



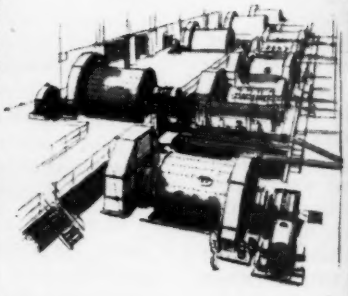
FOR REDUCTION CRUSHING

Symons Cone Crushers are built in both Standard and Short Head types, in sizes from 22" to 7' in diameter. Capacities from 6 to 900 or more tons per hour.



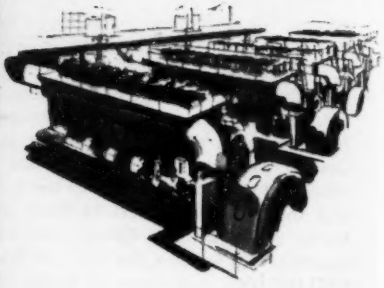
FOR SCREENING

From scalping to fine screening, there is a Symons Screen built to do a better job at low cost. Let Nordberg experience help you select the screen best suited to your needs.



FOR WET AND DRY GRINDING

Nordberg Grinding Mills include Rod, Ball, Pebble, Tube and Compartment types, in sizes from 6' to 13' in diameter and up to 50' in length.



FOR POWER GENERATION

Nordberg engines are built in sizes from small 10 horsepower units to over 12,000 horsepower... and are available for Diesel, Duafuel® and Spark-Ignition Gas operation.

NORDBERG MFG. CO., 19 Curzon Street, London W.1. England

Telephone: Mayfair 3067-8 Cables: Nordberg, London

Head Office
MILWAUKEE, WISCONSIN, U.S.A.

JOHANNESBURG: 6 Hollard Street.
MEXICO, D.F. Post Box 7816.

NORDBERG THE WORLD OVER

Represented in principal trading areas throughout the world

As an indication of the wealth and size of the materials stockpiled, *American Metal Market* gives the following remarkable information: "The total weight of the strategic materials in Uncle Sam's 215 security-tight store-houses is 26,000,000 tons occupying approximately 25,300,000 gross sq. ft. of warehouse space and 57,000,000 sq. ft. of open space. If the materials stored only in the last six months of 1960 had been loaded on freight cars for delivery, the train would have been 340 miles long! And this was a very slack buying spree!"

The most popular storage plan in recent years has been to place the materials at "plant-site", where they would be easily available in an emergency. This type of storage has cost the government an average of about one-tenth of a cent per ton per year.

Now stockpile buying has dwindled to next to nothing and most acquisitions are through the CCC barter programme. In its latest semi-annual report on the programme, OCDM reported to Congress that no new commitments had been made for minerals or materials during the last half of 1960. Deliveries under previous commitments during the period were valued at approximately $6,400,000.

Strategic stockpile inventories of the 76 materials on the stockpile list as of December 31, 1960, equalled or exceeded maximum objectives for 51 materials and basic objectives for 62 materials. OCDM stated that additional quantities in other government inventories, if added to the stockpile, would change these totals to 61 maximum and 68 basic objectives.

Most of the stockpiles were originally intended to carry U.S. industry through five years of warfare, then most of the maximum objectives were reduced to three years. Finally, to quote our contemporary, "following sputnik one, the whole spectrum of stockpile objectives went out of the window".

It is by no means improbable that stockpiling might yet prove a most profitable venture for Uncle Sam, having regard to the world's growing appetite for minerals and metals. In the event of continuing inflation, coupled with progressive exhaustion of the more high-grade and accessible deposits, the U.S. national stockpile may well prove to be the greatest bargain basement in history.

JAPAN'S NON-FERROUS METAL IMPORTS

According to the Japan Mining Association, foreign countries have been urging Japan to increase imports of non-ferrous metals and hold down purchases of ores and scraps.

Foreign delegates at the International Lead and Zinc Study Group meeting held in Mexico City in March this year were critical of Japan's importing methods, it was stated. These methods were alleged to be disrupting the international market for raw materials.

The Japan Mining Association also said foreign countries were unofficially suggesting that Japan should liberalize imports of electrolytic copper and reduce the import duty on it, which at present is 10 per cent. At present imports of electrolytic copper and scrap copper are restricted by the Japanese government, while imports of copper ore and copper based alloy scraps are free. As the Association points out, Japanese non-ferrous metal industries are making every effort to put imports of ores and scraps on a long-range basis and conduct joint development of overseas non-ferrous ore resources. (Indeed, scarcely a week passes without some reference in this journal to Japanese efforts to develop long-term ore supplies.)

Japan's imports of non-ferrous ores and scraps have been rising sharply in recent years owing to mounting requirements from both manufacturers of capital goods required for economic expansion and makers of durable goods. According to the Japan Mining Association, Japanese copper smelters are now importing nearly half of the copper ores available in the international market. Imports rose from 45,000 tons in the 1958 financial year (April to March) to 108,000 tons in the 1960 financial year, and are expected to reach 130,000 tons in the current financial year. The Association suggests that heavy Japanese imports of copper-base scrap alloys may have been partly responsible for the recent increases in the U.S. copper prices.

Consumer industries allege that one of the reasons for the heavy imports of ores and scraps is the high price standards of copper produced by Japanese smelters, whose operations, they maintain, have not been sufficiently modernized. They, too, would like to see imports of electrolytic liberalized and the import duty reduced, so that imports of copper metal, scraps and ores might be more evenly spread and their import prices reduced.

Japan's imports of lead ore rose from 27,000 tons in the 1958 financial year to 42,000 tons in the 1960 financial year, and are likely to amount to 60,000 tons in the current financial year. Zinc imports this year are expected to total 140,000 tons, compared with 65,000 tons in 1959.

COAL RESEARCH IN THE UNITED STATES

The new Office of Coal Research set up the U.S. Department of the Interior will complement the longer-term research of the Bureau of Mines by concentrating on projects showing promise of more immediate expansion of coal markets.

Speaking at the 1961 Coal Show of the American Mining Congress, Cleveland, Ohio, on May 15, Mr. John M. Kelly, Assistant Secretary of the Interior for Mineral Resources, praised the remarkable achievement of the U.S. coal industry in holding its over-all cost of operation steady despite the trend of most commodities toward increased cost. Pointing out that this had been due in part to research in mechanical engineering, research in the application of electronics for automation in mining and preparation, research in metallurgy, in hydraulics, in marketing, and in new applications, Mr. Kelly emphasized the necessity for finding new and better uses for coal, and for doing so as promptly as possible.

Instancing some of the problems likely to be investigated by the Office of Coal Research, he mentioned further work on the gasification of coal with the aim of producing a gas which could be mixed with natural gas for industrial and consumer use; the devotion of more energy toward the creation from coal of a liquid fuel which could be utilized by oil refiners; and the development of efficient, inexpensive new methods of transporting coal.

Reference was also made to a proposed long-range study of fuel and energy resources which is pending before the Congress. In this context Mr. Kelly emphasized the need for knowing how to define in specific terms what the public interest really is, when confronted with the technical, economic and international problems entailed in fuel resources development and use.

As to the extent of United States coal resources, Mr. Kelly said that available coal reserves amounted to "perhaps three-quarters of a trillion tons", assuming mining recovery of as little as 50 per cent of coal in place in the more available seams. The view was expressed that, under improved technology, fully half as much again would eventually be available.

The ECAFE Countries in 1960

THE term "ECAFE region" is used to denote the private enterprise countries of Asia and the Far East and excludes the centrally planned economies of mainland China, Northern Korea and northern Viet-Nam, though the latter countries are also considered in the report.

For the ECAFE countries the year 1960 continued the improvement noted in 1959, but the advance of 1960 over 1959 was less striking than that of 1959 over the previous year, which had experienced an adverse harvest and a slowdown in industrial production. Both agriculture and industrial output reached record levels in 1960, earnings from exports were higher, more imports were obtained, and restrictions on foreign trade and payments eased. However, the year ended worse than it began. Export markets turned soft and harvest prospects indicated only a slight increase.

This review is extracted from "Economic Survey of Asia and the Far East 1960", which is the fourteenth in a series of reports prepared annually by the secretariat of ECAFE. The sales number of this United Nations publication is 61.II.F.1 and the price $U.S.3.00 or 21s. stg.

Mining

The growth of industrial (mining and manufacturing) output has resumed its upward trend; in the first half of 1960 it was 11 per cent higher than in the second half of 1959. As in the past, however, mining lagged behind manufacturing. In the table of industrial production (1953 equals 100) the mining index rose from 150 in 1958 to 152 in the first half of 1959, 160 in the second half, and 168 in the first half of 1960, the percentage gains in the last two periods being respectively 11 and 5 Mining now accounts for 12 per cent of the region's industrial production, non-metallic mineral products for 4.5 per cent, and basic metals for 6.2 per cent.

The region's tin producing countries took advantage of the favourable demand conditions, states the report, and of the progressive reduction and final abolition of export quotas. The annual rate of production (in terms of concentrates) rose in the Federation of Malaya by 33 per cent in the first half of 1960 over that of 1959 and in Thailand by 26 per cent; it declined by 4 per cent in Indonesia.

In the first half of 1960, average monthly production of iron ore rose by 35 per cent in India and by 36 per cent in the Federation of Malaya over the corresponding figures for 1959. As compared with 1959, the annual rate of coal production increased by more than 8 per cent in China (Taiwan), 9 per cent in India, and 28 per cent in Southern Korea. In mainland China a 20 per cent increase in production in 1960 over 1959 was forecast. The development plans of Afghanistan and Pakistan have also endeavoured to emphasize local production of coal. In the latter country, re-organization and mechanization of mining operations and exploitation of newly discovered reserves in Baluchistan were expected to help.

Base Metals

Apart from pig iron and ferro-alloys, the manufacture of steel rose steeply. In Japan, the iron and steel industry made rapid strides; monthly average rose from 1.250,000 tonnes in the first half of 1959 to 1,750,000 tonnes in the first half of 1960. Improvements in technique served to keep costs down.

Production of steel in mainland China was expected to be around 18,000,000 tonnes in 1960. The progress achieved is attributed to the rise in technical efficiency and to the large investment made in order to expand the industry in the integrated steel centres such as Anshan, Wuhan and Paotow.

In the first half of 1960, an increase of over 24 per cent was registered in the average monthly output of steel in India which rose from 206,000 tonnes to 255,000 tonnes. The rolling mill at Bhilai went into operation in November, 1959. The other steel plants in the public sector, located at Durgapur and Rourkela, have also started production and these, together with the planned expansion of the industry in the private sector, will raise the nation's steel production capacity to 6,000,000 tonnes a year. However, it might take a year or two before full production is reached. With increased local production, iron and steel imports have been reduced. Capital equipment and light engineering industries in India also received an impetus from the expansion of the iron and steel industry.

The other newly developing economies in the region—especially Burma, Ceylon, China (Taiwan), Indonesia, Iran, Southern Korea, Pakistan, the Philippines and Singapore—are in the initial stages of planning and development. They appear to be encountering numerous difficulties due to lack of trained manpower, inadequate supplies of raw materials, smallness of the domestic market, and no clear prospects of exports.

The growth in the zinc and copper industries was maintained, especially in Japan. Production of copper rose substantially in the Philippines. There was no significant increase in the region's production of lead. Aluminium gained further ground, especially in Japan and India, and production levels were the highest attained.

Non-Metallic Mineral Products

The cement, brick and tile and glass industries, because of the booming demand for construction materials, together with the simpler production techniques, availability of materials, requirements of relatively less skilled labour, smaller amounts of capital, and the possibility of organizing production on a medium or small-scale, have been favourites in many countries of the region which are taking their first steps in industrial development. The region's production of cement increased from a monthly average of 2,600,000 tonnes in the second half of 1959 to 2,800,000 tonnes in the first half of 1960. This improvement was accounted for by Japan's production alone, which was 1,600,000 and 1,800,000 tonnes in the respective periods.

The non-metallic mineral industries continued to be confronted by problems of transport shortages, rising handling and fuel costs, and the lack of raw material surveys. In large countries such as mainland China and India, the industry was being widely dispersed in a number of places, in close proximity to raw materials or markets.

Exports

The volume of mineral exports of the ECAFE region has increased. Exports of iron ore showed a further gain in the first half of 1960 of 15 per cent over 1959. This increase came mainly from the Federation of Malaya, while exports from India and the Philippines declined. The major destination of the exports was Japan, whose total imports of iron ore, standing at an annual rate of over 14,000,000 tonnes in the first six months of 1960, went up by 36 per cent from 1959. Imports from the Philippines—formerly the largest supplier—held up over the decade of the 'fifties without much increase, whereas the Federation of Malaya and India have increased their share in Japan's imports to become major suppliers.

Iron ore is in direct competition with scrap metal, which is mostly purchased from the United States. The trend seems to be that iron ore imports in Japan are increasing steadily, while scrap exports from the United States fluctuate rather violently with the business cycle.

Japan's Raw Material Costs

Some major imports which have to be hauled from long distances have increased Japan's raw material costs. In 1959, the Japanese prices of some of these main imports were higher than those in the United States; e.g., iron ore by 32 per cent and coking coal by 63 per cent. The report points out that this heavy dependence on imports is a competitive disadvantage *vis-à-vis* many of the leading industrial countries.

This price problem is being tackled by the development of raw-material saving techniques. In the manufacture of iron, for example, not only has the size of blast furnace been improved, but the coke used per ton of pig iron has been reduced considerably, year by year, until it is now said to be at about the lowest ratio in the world. The steel-making process has also been improved by using oxygen to reduce heat and to lower pig iron requirement. The success achieved in controlling heat has benefited many industries, notably the cement industry. The increase in the size of electrolytic furnaces has benefited aluminium production.

The raw material problem has also been met by a switch-over from dearer to cheaper—or scarcer to more abundant—raw materials. The electrolytic method and the use of coal are being displaced by the use of petroleum and natural gas, saving about 40 per cent of the coal requirements in 1959. This change-over, which has helped to save on costs, is rapidly growing in the iron and steel, glass and thermal power generation industries. The development of domestic petrochemical industries will also encourage this substitution.

Another favourable factor in recent years has been the lower costs of transportation. Freight costs account for a large part of the prices of some imports, such as petroleum and iron ore. The lowering of freight rates has reduced the disadvantage suffered by Japan in common with other countries depending on maritime transport for their raw material needs.

New Markets for Lead

LEAD has several important roles in "solid state physics", it was stated at the American Lead Industries Association meeting held in Chicago recently.

Notable developments covered in the meeting were piezoelectric lead zirconate-titanate called PZT, which generates electricity when pressure is applied and its use in sonar, ultrasonic cleaning and gasoline engine ignition; pearlescent lead pigments; thermoelectric lead-telluride; and a new lightweight structural material—glazed lightweight clay blocks.

Harry Osterman, vice-president of marketing, Branson Instruments, Inc., claimed that high efficiency PZT made it possible to produce ultrasonic cleaning equipment with cleaning rates more than double that of older types, and at lower initial cost. Low cost applications include high-speed degreasing and pickling of metal wire, bar and strip.

A revolutionary new method for ignition of gasoline engines using PZT ceramics to supply the spark is in production at Clinton Engines Corporation in Clinton, Michigan. Smaller than a man's fist, the spark pump replaces the magneto, points, coil and condenser and delivers constant full voltage at all engine speeds.

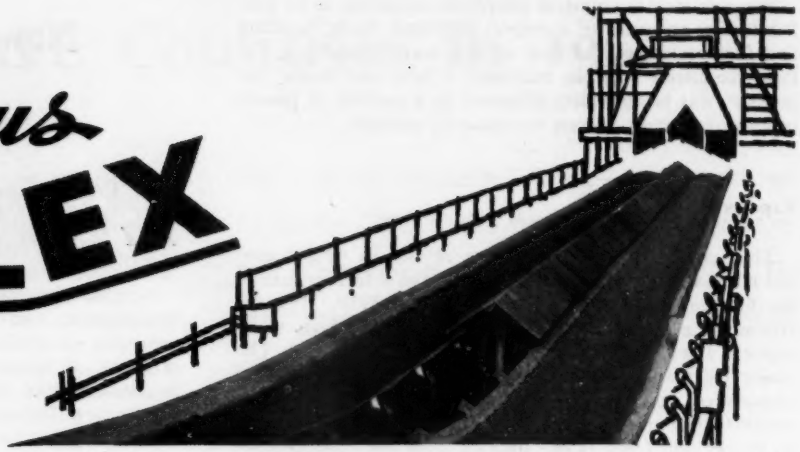
Mr. S. Turner, of the Lead Industries Association staff, outlined the future of lead-telluride in thermoelectric power generation. He said thermoelectricity—the ability of a material to generate current when heat is applied—has the design advantage of providing power from heat without moving parts. A conversion efficiency from heat to electricity of about 9 per cent makes these power packages very attractive in "waste heat" applications. For portable power for areas which are remote from power lines, Minnesota Mining and Manufacturing is developing a thermoelectric power pack to supply power from waste furnace heat to run fans or pump equipment in home heating systems. This project is being supported by twelve gas utilities, it was reported. The aim is to develop a mass produced package at a cost of less than $1 per watt.

Despite a trend toward motor vehicle batteries with less lead, there will be 32 per cent general increase in lead required for battery production by the year 1976, C. Herbert Allen told the Lead Industries Association.

Mr. Allen predicted that, "The amount of lead per battery will become somewhat less than at present, and battery life will become even longer". But quoting statistics from the U.S. Bureau of Public Roads, Mr. Allen said whereas there were 73,900,000 vehicles currently registered in the United States today, there would be 113,642,000 vehicles by 1976, or a 53 per cent increase over last year, and, "unless there are drastic changes in the sources of electric power used in automobiles, lead for lead-acid batteries will probably be on the increase for years to come".

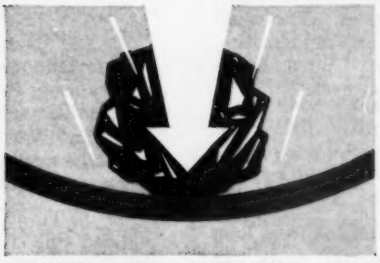
The potential market for battery powered route delivery trucks exceeds 150,000, said Cleveland Vehicle's vice-president and general manager, M. McMullan. He estimated that last year 42,000 gasoline powered delivery trucks were sold, primarily for urban route service. If electric trucks could gain only ten per cent of these sales, a market for 9,000,000 lb. of lead for batteries would be opened.

Angus GAFLEX

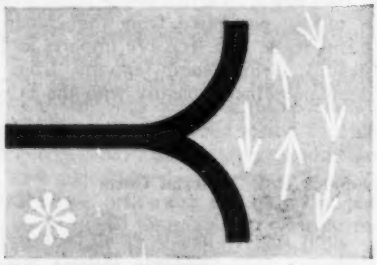


..the belt with the

Careful analysis of causes of failure in conventional belts has led to the development of Gaflex—the nylon wefted conveyor belt with five improved characteristics.



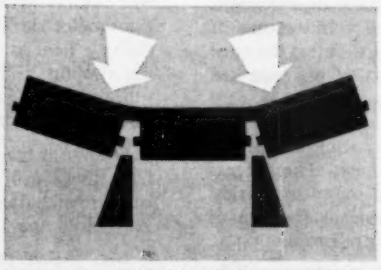
SUPERIOR IMPACT RESISTANCE . . . . . .



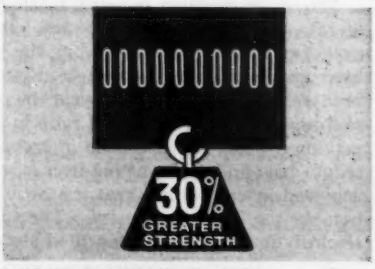
IMPROVED FLEXING LIFE . . . . . .

five point plan for

SUPERIOR TEAR RESISTANCE . . . . . .



IMPROVED TROUGHING CHARACTERISTICS . . .



IMPROVED FASTENER HOLDING . . . . . .

better performance

* *The flex life of the belt (previously the prime ageing factor of conveyor belting) is outstandingly increased by the Nylon weft in Gaflex. The nylon weft gives supreme 'across the belt' strength and, at the same time, allows for a reduction in belt thickness —four plies of the new fabric are equal in strengh to five conventional fabric plies.*

GAFLEX has nylon weft for *extra* strength and flexibility

GEORGE ANGUS & CO LTD. Angus House, Westgate Road, Newcastle upon Tyne, 1 • *Export Division: 300, Grays Inn Road, London W.C.1.*

A37/60

622.643 F

Digital Decking Device for Mine Winders

CLAIMED to have many advantages over the more conventional shaft switches until recently used for decking mine cages, a new type of digital decking device has recently been installed for controlling the No. 111 winder of the Heinrich Bergbau mine, Essen-Kupferdreh, which is a floor-mounted winder with six deck cages, operated by a 1,420-kW. motor and capable of handling a payload of 13.6 tonnes at a winding speed of 9 m/s.

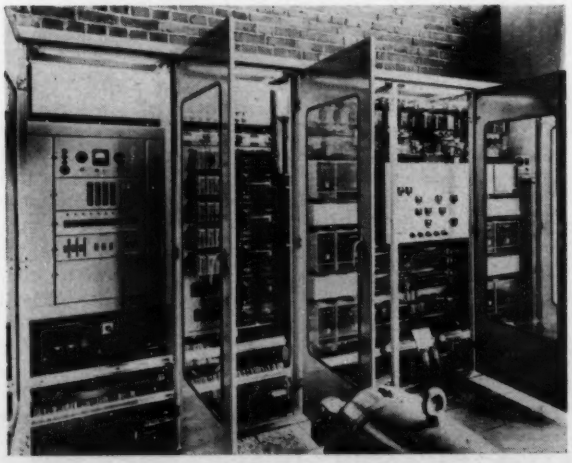
This decking device is one of three now installed by Brown Boveri & Co., Baden, Switzerland, since it was first demonstrated in 1958 at the mining exhibition in Essen.

Because of their periodically repeated operating programmes, mine winders are very suitable for control by automation. If the cage has a number of decks, but the filling and discharge points have only one level, the process of decking is difficult to control, since short decking times with exact stopping, free from jerks, are desirable if loading is to proceed smoothly.

Hitherto, the task of advancing the two cages, one deck at a time, by commands imparted by push-buttons at the loading point have been performed by shaft switches actuated by the cage. Through lengths of cable, these switches gave the commands to brake and stop and for this purpose the shaft had to be specially wired and installed with electrical equipment.

By the use of the decking device, however, these switches and associated cables have been rendered unnecessary. Not only does the new device control a normal preset programme of stopping and starting but it also permits a slow movement to be made in either direction on receipt of commands from push-buttons should abnormal positions be desired.

Control equipment for the decking operations at the No. 111 winder of Heinrich Bergbau AG, Essen-Kupferdreh. To the left is the decking device whose counters can be seen. In the next section is the control gear for automatic operation. In the following sections are the magnetic amplifier controllers



Incorporated in the Brown Boveri device is a digital system for measuring distance and counting. The distance travelled by the cage is measured by an impulse generator on the braking rim of the driving sheave and it is fed into an electronic counter as the multiple of a 5 mm. unit distance. In such counting, the direction of movement has to be taken into consideration since it is important for correction of movement to be possible in both directions. Points on the travel at which the braking and stop commands have to be imparted to the winder can be set by means of numbered switches and, if necessary, during service. They are easily adjustable and the accuracy of setting corresponds to one of the 5 mm. unit distances.

Ensuring the efficient operation of this new digital decking device is a two line defence system against failure. In parallel with the control system is a supervisory system which also consists of impulse generators, counters and numbered switches. The task of this supervisory system is to stop the cage should it overrun the set stopping point, contrary to the scheduled programme. In the event of this supervisory system failing, the second line of defence comes into operation. This is a built-in self-monitoring system which automatically indicates such failure. Visual indication of the counter readings makes it possible to determine the position of the cage at any particular moment.

The first of the three Brown Boveri digital decking devices to be installed has now been operating for over a year in connection with a winder for six-deck cages. This is powered by a 4,800 kW. motor and is capable of hoisting a payload of 25 tonnes at a winding speed of 16 m/s.

Experience with this installation has confirmed many advantages over the older shaft switch method. These include the reduced outlay of capital for installation and wiring in the shaft, as well as the easy accessibility and interchangeability of all components of the device. In service, these have been augmented by the exclusion of atmospheric effects and mechanical damage and especially the facilities provided for setting and adjustment.

Less time was required for erection and commissioning and stoppages for faults were fewer, resulting in an increase in the tonnage raised. In the machine room, where all the equipment is now concentrated, the amount of maintenance has been considerably less than would otherwise have been required for a shaft electrical installation. With the incidence of noise impulses rendered ineffective, the combined operation of the different components such as contactor circuits and transistor circuits, with their considerable differences in current and voltage levels, is now claimed to be perfectly reliable. Over the period of more than a year in which this first device has been working, there have been no failures of transistors, cold-cathode tubes and relays, nor any contact difficulties with the plug-in elements.

The visible indication of the counter reading has proved of value for setting the command points and for investigating the accuracy of stopping and the accuracy of the 5 mm. unit of distance has proved quite adequate for the smooth carrying out of operations at the pit-head.

Commonwealth Conference—II

DEVELOPMENTS IN THE VALUATION OF GOLD MINES

Development results on South African gold mines are grouped into payable and unpayable values on bases varying between the different mining groups. In most cases the values are obtained at 5 ft. intervals underground and are averaged over stretches of varying lengths averaging about 50 ft. The overall average value for the stretches with averages above the pay limit is then reported as the value for the payable development footage. One group, however, reports the average of all individual payable sampling sections as the value of the payable development.

The payable ore reserves are subsequently blocked out, regard being had to mining considerations and general value trends. As a result of the variations in value from section to section along a development end and even from stretch to stretch in local areas, the values of such ore blocks will almost invariably be based on the averages of a mixture of payable and unpayable stretches (or sections) in the development around the peripheries of the blocks. The average unadjusted ore reserve value will, therefore, always be lower than the corresponding average payable value reported in development, except when the payability is reported as 100 per cent.

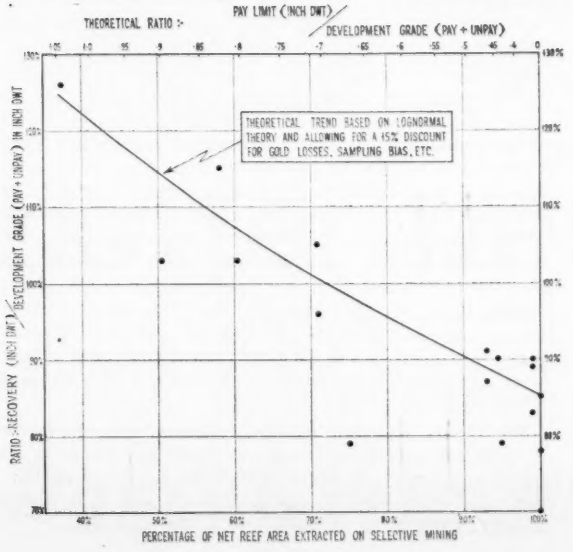
Furthermore, when stoping takes place it is not confined only to the payable ore reserve blocks. In order to ensure the maximum extraction of payable ore and/or for various practical mining reasons, a certain amount of stoping is also carried out in blocks classed as unpayable. The result is that the average grade of the ore actually stoped is in turn generally lower than the average (unadjusted) value of the payable ore reserves.

A further reduction in grade is unavoidable from the sampled stoping grade to the grade corresponding to the gold recovered due to losses of gold in mining and in plant residues, and bias errors in sampling, tonnage measurements, assaying, etc.

In order, therefore, to estimate the likely average recovery grade to be expected from an overall average value in development (payable plus unpayable) full cognizance has to be taken of the above mentioned sources of dilution, loss and/or bias which tend to reduce the improvement to be obtained from selective mining. This improvement will always be less than that suggested by the reported values of payable development or by the average of the payable borehole values for an area.

An analysis[6] of the results achieved by some 17 large mines over varying periods of up to 23 years has shown that there is a distinct correlation between the ratio of the recovery grade of the ore milled to the corresponding average development value (both being expressed as in. dwt. values) and the percentage of the reef area actually selected for mining. This is evident from the average trend for these mines shown on Fig. 2. The trend curve fitted to the observations corresponds to the theoretical position based on the lognormal frequency distribution of the values of blocks of ore as selected for mining. Fig 2 can, therefore, be used for estimating the likely recovery grade (in in. dwt.) and the percentage of ore to be extracted on selective mining, from the average in. dwt. value and the pay limit.

Fig. 2. Graph showing relationship between recovery grades and underground development values for 17 large gold mines


THEORETICAL RATIO :-
PAY LIMIT (INCH DWT)
DEVELOPMENT GRADE (PAY + UNPAY)
THEORETICAL TREND BASED ON LOGNORMAL THEORY AND ALLOWING FOR A 45% DISCOUNT FOR GOLD LOSSES, SAMPLING BIAS, ETC.
RATIO RECOVERY (INCH DWT) / DEVELOPMENT GRADE (PAY + UNPAY) IN INCH DWT
PERCENTAGE OF NET REEF AREA EXTRACTED ON SELECTIVE MINING

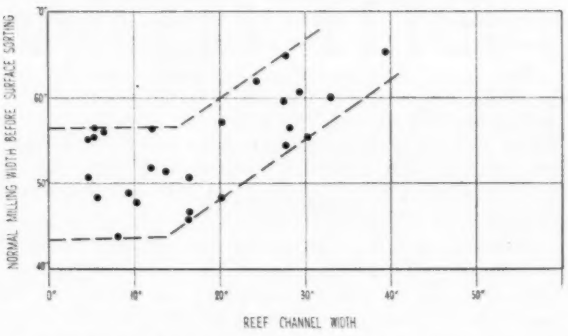


Fig. 3. Graph showing relationship between normal milling width (before sorting) and reef channel width for 26 large gold mines

Milling Width, Recovery Grade and Mill Tonnage

The estimated recovery grade in in. dwt. being a measure of the gold recovered per unit area of reef mined now requires to be divided by the estimated milling width (which is a measure of the tonnage milled per unit reef area mined) to yield the estimated recovery grade in dwt./ton. At the same time the milling width has to be applied to the net reef area to be mined (after allowing for fault losses, the dip of the reef, and percentage extraction) in order to arrive at the estimated total tonnage of ore to be milled.

The milling width is dependent mainly on three factors, i.e., the channel width of the orebody, hangingwall conditions and the percentage of mined waste to be removed by sorting, the last-mentioned factor being partly determined by the other two factors and partly by policy. Fig. 3 shows graphically the present relationship between the average channel width and the normal milling width before sorting for 26 large gold mines including the new producing mines established since the last world war.

GOLD MINING PROPERTIES FROM BOREHOLE RESULTS – II

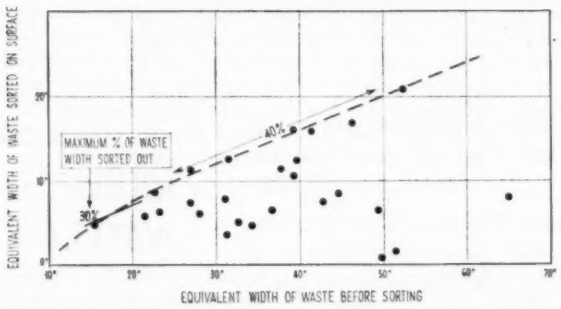

EQUIVALENT WIDTH OF WASTE SORTED ON SURFACE
MAXIMUM % OF WASTE WIDTH SORTED OUT
40%
30%
EQUIVALENT WIDTH OF WASTE BEFORE SORTING

Fig. 4. Graph showing relationship between the equivalent widths of the waste reaching the sorting station and of the waste sorted out for 26 large gold mines

From this figure it is evident that hangingwall conditions can play a vital part in determining the extent of the waste to be mined and milled apart from the ore in the actual reef body. It is essential, therefore that the evidence from borehole cores in regard to likely hangingwall conditions be studied carefully in order to allow of a reasonable assumption of the extent if any, to which hangingwall conditions are likely to increase the normal milling width beyond that indicated by the lower trend line of Fig. 3.

Fig. 4 shows the present average relationship for the same mines between the exterior waste width and the equivalent width of waste sorted out before milling. In this case the trend of the maximum sorting width is significant and represents a measure of the maximum extent to which sorting can be carried out where this is the accepted policy and where there are no special reasons why this cannot be achieved. It appears that a maximum of about 40 per cent of the waste rock reaching the sorting station can be sorted out in practice.

Figs. 3 and 4 can, therefore, be used to estimate the likely milling width (after sorting) from the indicated average channel width after making allowances where necessary for abnormal hangingwall conditions and for sorting policy. From this width, from the geological interpretation of the overall reef structure (including the extent of fault and dyke losses, the dip of the reef, the position of the sub-outcrop etc.,) and from the estimated percentage of the net reef area to be mined (dealt with above), the likely tonnage of ore to be milled over the life of the property can be determined. Furthermore, the estimated recovery grade in in. dwt. divided by this width provides an estimate of the likely recovery grade in dwt./ton. It should be noted that in the early period of expanding production and building-up of a reasonable ore reserve, a substantial amount of development in excess of normal requirements is done and if the ore from all this development is milled, milling width will be above the normal.

Mining Programme

Mining programmes for the exploitation of new large gold mining properties vary considerably from one property to another, each being dealt with on its own merits. For the purpose of this review, however, the requirements for an average large mine under present conditions may be accepted as being of the following order :

The article appearing herewith is condensed from a paper presented at The Seventh Commonwealth Mining and Metallurgical Congress convened in Southern Africa. It is one of a series in which papers of particular interest are offered in abridged form

Years	*Capital expenditure (£ millions)*	*Tons milled*	*Working costs shillings/ton*
1/4	12.00	—	—
5	2.25	600,000	65/-
6	2.25	900,000	65/-
7	2.25	1,200,000	65/-
8	2.25	1,400,000	60/-
9	2.25	1,600,000	55/-
10/end	7.50	1,800,000 p.a.	50/-

The mining area is usually between 4,000 and 5,000 claims (i.e., 256,000,000 to 320,000,000 sq. ft.), and the depth of the economic reef horizon from 3,000 to 8,000 ft. below surface. The average reef channel width of, say, 36 in. will correspond to a normal milling width of 50 in. after sorting say 9 in. of waste on surface.

Without various refinements normally effected, the stoping pay limit corresponding to a recovery grade of 4.0 dwt./ton (which is just sufficient to cover eventual working costs at 50s. per ton with gold at £12 10s. per oz.) is

$$= \frac{50 \times 4}{48 \times 0.85} = 4.9 \text{ dwt./ton}$$

or say 235 in. dwt. over the average measured stoping width of say 48 in.

Accepting this pay limit and assuming that the borehole estimate for the property is say 600 in. dwt. with 5 per cent confidence limits of 360 and 1,200 in. dwt., the corresponding recovery grades and mill tonnages are as follows :

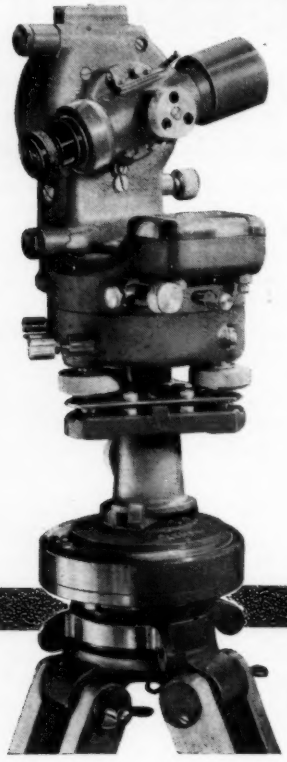
	Estimated average in. dwt. value		
	Likely 600	*Lower limit* 360	*Upper limit* 1,200
Pay limit (235)/average value	.39	.65	.20
From Fig. 2			
Recovery/average value	.87	.97	.85
Recovery grade;			
in. dwt.	522	349	1,020
dwt./ton	10.4	7.0	20.4
% net reef extraction	97%	77%	100%
Mill tonnage:			
4,000 claims @ 15° dip less 15% for fault losses = 226 million square feet of reef:			
Reef area extracted (million sq. ft.)	219	174	226
Mill tonnage @ 50 in. milling width	76m.	60m.	79m.

(continued overleaf)

By D. G Krige

FINANCIAL ENGINEER, ANGLO-TRANSVAAL CONSOLIDATED INVESTMENT CO. LTD.

Watts Mining Transit



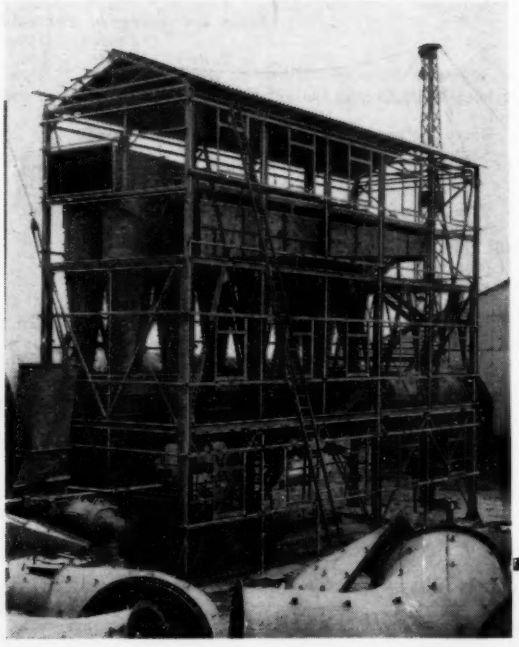
For elementary surveying above and below ground to an accuracy better than 1 : 3000.

The Mining Transit is a simple, light instrument with glass circles divided at 5-minute intervals, and it is easily read to 1 minute.

HILGER & WATTS

For full details, write for CS 58/138
HILGER & WATTS LTD., 98 ST. PANCRAS WAY, LONDON, N.W.1
Telephone: GULliver 5636

BUELL
Regd. Trade Mark



DUST COLLECTION AND REMOVAL

Buell experience in the assessment of the problems of dust removal from air and gases, employing the Van Tongeren System, can be particularly applied to the *efficient* collection of dusts arising from crushing and screening, rotary kilns, dryers, metallurgical furnaces etc. The illustration shows (under construction) Buell high-efficiency equipment for collecting dust from a rotary kiln processing magnesite.

BUELL LIMITED
(a subsidiary of Edgar Allen & Co. Limited)
THREE ST. JAMES'S SQUARE · LONDON S.W.1
Telegrams: Allentare Piccy, London Telephone: Trafalgar 2528 (3 lines)

On the basis of these grade and tonnage estimates the financial implications of the suggested mining programme can now be analysed. For this purpose it is, however, necessary to refer briefly to the taxation and leasing systems for large gold mines in South Africa.

The right to mine for gold and precious metals is reserved to the State and is leased on reasonable evidence of a workable proposition to the owner of the mineral rights (usually the mining or exploration company which undertook the drilling programme after having obtained an option over the mineral rights from the farm owners). Lease consideration payable to the state for all new large mines since the second world war has taken the form of a sliding scale defined by the formula

$$Y = a - \frac{6a}{x}$$

where Y is the percentage of the profits payable to the state as lease consideration, x is the ratio (per cent) of profits to recovery (i.e., revenue) and a is a constant which has varied between 10 and 30, and is fixed by the state.

All capital expenditure (except cost of mineral and surface rights, share issue expenses, etc.) incurred in opening up the mine is allowed as a prior deduction from profits before lease consideration is paid, as well as a capital allowance of 5 per cent p.a. simple interest on the unredeemed balance of such capital expenditure. In the case of a low grade proposition this capital allowance can accumulate to many millions of pounds before payments.

The lease consideration is allowed as a deduction for income tax purposes, the taxable income also being determined after allowing the relevant capital expenditure items as an immediate cost, but without capital allowance. (A recent concession has been made for deep-level mining where a special 5 per cent p.a. compound interest allowance is allowed for tax purposes.) The taxation payments are also calculated on the same type of sliding scale formula as above, with the constant a at present fixed at 60. (For annual taxable incomes below £70,000 further concessions are applicable.)

The sliding scale type of payment can be simplified as:

$$\text{Payment} = a\% \text{ (Profits} - 6\% \text{ Revenue)}$$

and no payments are therefore made unless the profits earned exceed 6 per cent of the revenue. As profits increase above this level, the rate of payments (per cent) rises rapidly and reaches a theoretical maximum of $0.94a$ per cent of profits when profits equal revenue.

For all practical purposes the taxation and lease formulæ can be combined as follows:

Lease formula say 20%	(Profits—6% Revenue)
and tax formula of 60%	(Profits after lease payments)
	(—6% Revenue)
is equivalent to a combined	
[20% + (60% × 80%)]	(P—6%R)
=68%	(Profits—6% Revenue)

which means that in effect the state participates in profits to the extent of about two-thirds after allowing the company a free margin equivalent to 6 per cent of the revenue.

Grade to ensure the repayment of the total capital investment (without any return thereon) is determined as:

Total working cost from capital expenditure table on, say, 60,000,000 tons	= £153,000,000
Total capital expenditure	= £31,000,000
Total:	= £184,000,000
	= 61.4s. per ton milled
and recovery grade required	= 4.91 dwt./ton.

The lower limit of 7.0 dwt./ton is therefore well above this grade.

The annual profits, taxation and lease consideration on the basis of the stipulated mining programme and for a lease formula with a at say 20 can now be calculated for a range of grades above the lower critical level of 4.9 dwt./ton and for the corresponding tonnages shown at bottom of previous page. For each grade in this range, the compound interest rate is then determined which will give the same present value for the amounts of equity capital to be raised and for the net profits available for dividends over the life of the mine. Thus the compound interest return corresponding to any specified recovery grade is found.

The single compound interest rate is preferred to the more complicated and unrealistic double rate based on Hoskold's formula because it enables a direct comparison with alternative avenues of investment. Thus a 10 per cent return on the single compound interest basis means simply that if one investor invests his capital in the mining venture offering this return and another investor invests equivalent amounts of capital simultaneously in a bank, then the bank would have to offer a 10 per cent p.a. interest rate to enable the second investor to draw annually amounts equivalent to those obtained by the first investor in the form of dividends and to have his investment depleted at the same time as the mining company is liquidated.

A possibility to consider is whether the risk should be reduced by the drilling of further boreholes. In this regard the lower 5 per cent confidence limit rises fairly rapidly as the number of borehole values increases up to say 15 and then at a progressively decreasing rate so that the advantage gained from the drilling of an additional borehole will on average decrease progressively as more boreholes are drilled. It is, therefore, possible to base the required decision on a comparison of the indicated increase in confidence from additional drilling with the cost and extent of such drilling.

REFERENCES

1 AITCHISON J. and BROWN A. C.—*The Lognormal distribution*—University Press, Cambridge, 1957.

2 HEYNS A. J. A.—*A problem in borehole valuation*—Unpublished paper read before South African Statistical Association—1958.

3 KRIGE D. G.—*A statistical approach to some basic mine valuation problems on the Witwatersrand*—J. of the Chem. Metall. and Min. Soc. of S. Afr. (Dec. 1951)—discussions and replies March 1952, May 1952, July 1952 and August 1952.

4 KRIGE D. G.—*A statistical analysis of some of the borehole values in the Orange Free State goldfield*—J. of the Chem. Metall. and Min. Soc. of S. Afr. (Sept. 1952)—discussions and reply November 1952 and February 1953.

5 KRIGE D. G.—*'n Statistiese analise van die vernaamste risiko verbonde aan kapitaal-belegging in nuwe goudmyne in Suid-Afrika*—Tegnikon, Oct. 1955.

6 KRIGE D. G.—*A study of the relationship between development values and recovery grades on the South African goldfields*—J. of the S. Afr. Inst. of Min. and Metall., January 1959—discussion and reply April and October 1959.

7 KRIGE D. G.—*On the departure of ore value distributions from the lognormal model in South African gold mines*—J. of the S. Afr. Inst. of Min. and Metall.—November, 1960.

8 ROSS F. W. J.—*The development and some practical applications of a statistical value distribution theory for the Witwatersrand auriferous deposits*—unpublished Master's thesis, University of the Witwatersrand, 1950.

9 ROWLAND R. ST. J. and SICHEL H. S.—*Statistical quality control of routine underground sampling*—J. of the S. Afr. Inst. of Min. and Metall. Jan. 1960—discussions March and May 1960.

10 SICHEL H. S.—*An experimental and theoretical investigation of bias error in mine sampling with special reference to narrow gold reefs*—Trans. of the Inst. of Min. and Metall. Lond., Feb. 1947.

11 SICHEL H. S.—*New methods in the statistical evaluation of mine sampling data*—Trans. of the Inst. of Min. and Metall., Lond., Mar. 1952.

MINING MISCELLANY

Italian rock salt output is to be doubled, bringing it to 1,600,000 tonnes. The Volterra saline in Tuscany is to be expanded, raising output from 180,000 to 900,000 tonnes a year. Expansion is also proceeding at the Margherita unit in Savoy, where capacity is to be doubled, and at Cervia, Comacchio and Tarquinia. A new saline plant is to be built near Sant-t'Antioco in Sardinia, with an annual production potential of between 300,000 and 400,00 tonnes annually. Salt mining in Sicily is also under consideration, where seams of potassium chloride, up to 30 m. thick, occur together with thin salt layers.

*

A Soviet oceanographic expedition conducting research in the Indian Ocean has reported the discovery of large deposits of manganese in the central region of the Indian Ocean, at a depth of four to five km.

*

Sudan has sold its first shipment of manganese ore to the U.K., about 475 l.tons. Everitt and Co. purchased the 49 per cent ore, at £19 per ton from the Samkary Mining Co. of Port Sudan. The ore is mined at Halaib, a village on the Red Sea, 200 miles north of Port Sudan.

*

A deposit of iron ore, reported to be 6 km. in length and to contain an estimated 50,000,000 tons, has been discovered in the Raju (Aleppo) region of Syria.

*

The government has concluded plans for a ground and, possibly, aerial survey of West Sarawak to determine the extent of additional reserves of bauxite. The metal is at present mined by an overseas consortium, and exports $M.3,000,000 worth of bauxite annually.

*

The Georgi Dimitrov copper works at Izdremets, near Elisseina, Bulgaria now has three flotation plants in service, while another has been completed at Madjarevo, in the Rhodope mountains, with a daily capacity of 1,000 tons of lead-zinc ore.

*

National Lead Co. has started building a research centre in East Windsor Township, near Hightstown, N.J., U.S.A., the first unit of which should be completed by mid-1962. The present staff of scientists and technicians at the company's Brooklyn Research Laboratories will be then transferred to the new centre.

*

Denison Mining Co. of Canada has taken over control of Can-Erin Mining Co., and underwritten 400,000 Can-Erin shares. A drilling programme, to take from 6 to 12 months, at a cost of about £200,000 is to start at the copper mines at Allihies, County Cork, Eire. The drilling down to a depth of 2,500 ft., is mainly to test for possible extensions of the main zone in the Mountain Mine area. Work in this area has so far been concentrated on a rehabilitated shaft of 1,350 ft. Present resources are estimated at some 1,500,000 tons, grading 1.68 per cent, above the 2,100 ft. level, but it is considered likely that the structure extends below the 2,500 ft. level.

Under the terms of a long-term trade agreement between Bulgaria and Mongolia, for the period 1961-65, signed some months ago in Ulan Bator, Bulgaria will help the Mongolians to open up an asbestos mine and will provide all the plant required to produce asbestos products.

*

Australian Iron and Steel is starting drilling operations on the sea-bed to test the extent of high-grade iron ore deposits at Cockatoo Island, on the North West Coast of Australia.

*

It is reported from Sofia that Bulgarian geologists have discovered a rich deposit, estimated at some 800,000 tons of kyanite in the Rhodope mountains. The deposit is now being examined.

*

The Andes Copper Mining Co., an Anaconda subsidiary in Chile, has requested authorization to make a capital contribution of about $3,467,000, of which $761,000 would be in equipment, and 2,706,000 in foreign exchange (U.S. dollars), to be used on housing for workers, expanding water and power supply services and other utilities, and a new laboratory.

*

The Soviet Institute of Arctic Geology has sent an expedition to North Yakutia to prospect for new diamond deposits, reports *Soviet News*. It will work in the basin of the River Birekte, and explore an area over 3,800 sq. miles. Diamond prospecting is to be conducted on a much wider scale in Yakutia, where output is expected to show a 25-fold increase by 1965. Diamond production in 1960 figure was ten times greater than that of 1957.

*

South American Placers Inc., who began gold mining operations in Bolivia in 1960, were reported to have paid royalties of $194,713 for the first nine months of 1960, or about 23 per cent more than the $150,000 estimated in the Bolivian budget for 1960.

*

During 1960 Bolivia exported the following quantities of minerals (in tonnes): tin, 19,718; wolfram 1,290; lead, 21,419; copper, 2,271; antimony, 5,327; zinc, 4,027 and sulphur, 1,194; bismuth exports during the year (in fine kg.) were 183,064; silver, 152,005 and asbestos, 60,028 kilos; Gold exported during 1960 amounted to 1,413,874 fine grm.

*

H.M. Gustaf VI Adolf, King of Sweden, has opened the new steel research centre and laboratories of Sandvik Steel Works recently, at Sandviken, 120 miles north of Stockholm. This new organization, which cost about £500,000 includes an underground laboratory (really a mine in miniature) for the testing of drill steels.

*

During 1960, Taiwan Aluminium Corporation produced about 9,000 tons of aluminium, about 1,500 tons below capacity. Power shortage in winter reduced working, and the company has now joined with the Chinese Petroleum Corp. in the building of a 25,000 kW. thermal power plant.

Two National Coal Board apprentices have won regional awards in the 1961 Apprentice of the Year competition. The two apprentices, N. Riley and R. Fairbrother, are the first N.C.B. apprentices to reach the finals of this competition, sponsored by the British Junior Chambers of Commerce.

*

It is reported from Bulgaria that substantial deposits of gypsum have been discovered near Vidin.

*

Nor Sul, through its wholly-owned subsidiary Minas y Petroleos del Ecuador, S.A., holds concession areas in Ecuador covering 10,800,000 acres of potential oil lands and about 200 miles of gold dredging ground for 30 years, with option to renew. Mr. H. S. Strough, chairman of Nor Sul, states that, on the basis of a daily capacity of 8,000 cu. yd. proved gold reserves are sufficient for more than four years, with many times this yardage in indicated reserves.

*

It is reported from U.S. that Mount Rainier Coal Co., a subsidiary of Pacific Co. has signed a four-year contract with Mitsubishi Shoji Kaisha, representing eight Japanese steel producers, for shipment of 800,000 tons of coal to Japan. This is the first long-term contract of western U.S. coking coal for Japanese steelmakers. Shipments will begin early in 1962. The coal which will come from Wilkeson, Wash., will be brought to the port of Tacoma, Wash. by the Northern Pacific Railway.

*

The Office of Coal Research, created by legislation passed by the 86th U.S. Congress, has convened the initial meeting of its general technical advisory committee, which serves as a consulting body to the Federal Government. The Office will contract for, sponsor and co-ordinate research to develop new and more effective uses for coal, expand its uses and reduce costs.

*

The French non-ferrous mining company, Penarroya, has announced recently that an agreement has been concluded with the Spanish National Institute for Industry under which Penarroya will participate in the formation of a company, Carbonifera del Sur. Penarroya will hand over its concessions and collieries in the Cordoba area and the Spanish Institute will operate the mines in future.

*

The Rhodesian Selection Trust and Anglo American Corporation Group in Salisbury are notifying all the organizations representing African and European employees of their intention to transfer all African employees from their present retirement schemes to the Group pension and life assurance schemes, as a further step in the companies' policy of progressively eliminating racial distinctions in conditions of employment. The companies' announcement added that entitlements of existing members will remain unchanged and the increased membership which will result from the admission of Africans will accelerate the growth of the pension funds, administered by trustees, and should give increased security to the pensions of all members of the schemes.

Personal

Mr. Norman Readman, managing director of the Consolidated Pneumatic Tool Co., of London, was elected president of the Chicago Pneumatic Tool Co. of New York, in succession to Mr. Guy J. Coffey. Mr. Coffey becomes chairman of the board in succession to Mr. H. Arnold Jackson, who has retired, although remaining a director and chairman of the executive committee. Mr. Readman will leave for New York in September. The company also announce the following appointments to their board: Mr. S. H. Ireland, assistant managing director; Mr. L. S. Bright, financial director, and Mr. A. O. Miller, director.

★

Imperial Chemical Industries announce that Mr. T. H. Gallie and Mr. J. R. H. Crane have been appointed directors of the Metals Division of I.C.I.

★

Following re-organization of Associated Electrical Industries Cable Division, Mr. J. S. A. Bunting, formerly joint divisional general manager, has been elected to the board of AEI (Woolwich) Ltd. The following appointments have also been made in AEI Cable Division: Mr. E. J. Vidler to be divisional general manager, and director of AEI Divisional Management Company; Mr. F. V. Vaissiere to be divisional commercial manager; Mr. V. L. J. Plascott to be divisional manufacturing manager, and Mr. W. G. Hawler to be divisional chief engineer.

★

Mr. A. B. C. Daneel has been appointed technical adviser of the Transvaal and O.F.S. Chamber of Mines in place of the late Mr. M. Falcon. Mr. V. C. Robinson has been appointed chairman of the technical advisory committee.

★

Mr. James D. Wolff has resigned from the position of chairman of the board of the London Metal Market and Exchange Co., and Brigadier H. P. Crossland has been appointed chairman to succeed him.

★

Mr. J. W. A. Wright (chairman), Mr. W. S. Garrett (managing director) and Mr. J. S. Crawhall (director) of The Cementation Group's South African Co., have been visiting London, for discussions with the parent group.

★

Associated Electrical Industries has appointed Mr. G. F. Gribbin sales manager of its X-Ray Department.

★

Mr. F. B. Combes, chief designer of compressors, hoists and pneumatic tools for Holman Bros. since 1952, has been appointed general manager of Holman's subsidiary company, Maxam Power. Mr. Stanley Parnell has been appointed deputy to the chief engineer of the Holman Group, Mr. James Hodge.

★

Mr. Norman Elce, director and chief mechanical engineer of Associated Electrical Industries (Manchester), has retired after 41 years with the AEI group of companies. He has been appointed consultant to the managing director at Manchester.

British Insulated Callender's Cables announce the appointment of Mr. A. W. Thomson as technical manager of BICC-Burndy Ltd.

★

At the annual general meeting of the British Rubber and Plastics Belting Manufacturers' Association, Mr. David D. Marshall of the Greengate and Irwell Rubber Co. was re-elected chairman for 1961/62.

★

Dr. Howard Biers, who was designated by the American Institute of Mining, Metallurgical and Petroleum Engineers as its representative at the annual general meeting of the British organization, has been elected honorary vice-president of the Iron and Steel Institute, London.

Mr. F. W. Goodge, at present one of the joint assistant managing directors of Keith Blackman Ltd., has been appointed to succeed Mr. D. S. Woodley, who is retiring, as managing director from June 1. Mr. C. J. Atkins will become assistant managing director from that date.

★

Mr. H. L. Satchell has retired as director of manufacture, Associated Electrical Industries (Rugby) Ltd. Mr. H. E. Cox, M.I.E.E., has been appointed director of manufacture.

★

Wolf Electric Tools announce the appointment of Mr. J. O. Bovill as managing director of their associated company, Wolf Sales Pty., in Australia.

Company News

Saville (Tractors) Ltd. have been appointed dealers for International Harvester Co. of Great Britain for construction equipment in South West England.

★

Wickman Ltd. and L. Schuler A.G. of Wuertt, Germany, announce the formation of a jointly owned British company, to be known as Schuler Presses, Ltd., to manufacture certain Schuler presses in the U.K., and provide a U.K. based service to the press users. Wickman Ltd. are to act as exclusive sales representatives for the Schuler presses.

★

The General Electric Co. and Richardsons, Westgarth & Co. announce that they are to pool their resources for the design, development, sales and manufacture of heavy electricity generating and industrial power plant. The manufacture of all plant covered will be shared and initially based on current G.E.C. designs.

Coming Events

The 1961 Metal Mining and Minerals Convention of the American Mining Congress, which is to be held at Seattle, Wash., September 11-14, will have as its central theme the economic, legislative and practical operating problems of the U.S. mining industry.

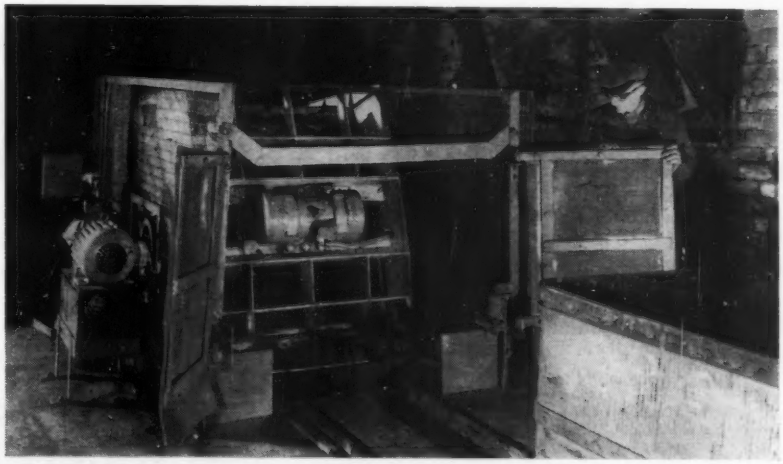
★

The latest developments in many fields of advanced technology will be shown at the Laboratory Apparatus and Materials Exhibition, at the Royal Horticultural Society's New Hall, Westminster, June 19-22. Among the lectures to be given is one on recent advances in techniques at the Tin Research Laboratory.

★

The 123rd annual meeting of the British Association for the Advancement of Science will be held in Norwich, August 30 to September 6. Further information may be obtained from the Secretary of the Association.

This vibrating tippler, using an English Electric vibrator motor, is one of three recently installed in the Northumberland and Cumberland Division of the N.C.B. It is used for removing the consolidated coal dust from 10 cwt. tubs at the rate of one a minute. The turnover unit is hydraulically operated and the 1½ h.p. vibrator motor operates at 1,500 r.p.m. The complete tippler has been developed by Byron and Jones Engineering Ltd.



everything for safety everywhere

Air Craft Seat Belts
Air Compressors
Breathing Apparatus
Motor Car Safety Harnesses
Diving Equipment
Dust Respirators
Gas & Fume Respirators
Protective Clothing
Resuscitation Equipment
Safety Helmets
Smoke Masks & Helmets

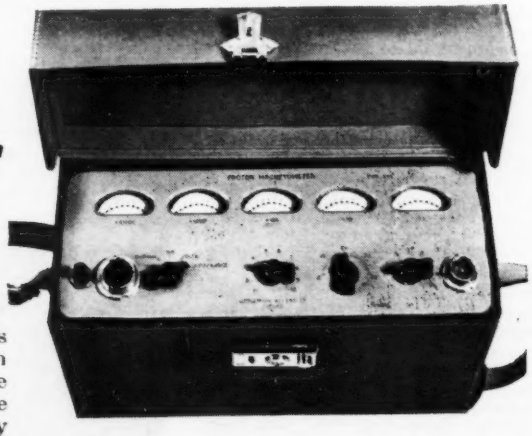
SIEBE, GORMAN & CO. LTD.,
Neptune Works, Davis Road, Chessington,
Surrey. Telephone: Elmbridge 5900
Manchester Office: 274 Deansgate
Telephone: Deansgate 6000

SIEBE GORMAN
A Member of The Fairey Group of Companies

Proof against fools! * Proof against geologists!

ELSEC Proton Magnetometer

At last, geomagnetic surveying can be easy, quick, inexpensive and foolproof



THE ELSEC PROTON MAGNETOMETER measures the earth's magnetic field intensity with a sensitivity of better than 2 gamma. The ELSEC is ready for use anywhere in the world without internal adjustment (the whole range of the geomagnetic field from 0·2 to 0·7 oersted is covered by panel-mounted switches). The ELSEC is fully transistorized so that it weighs only 20 lb. and measures only 13" x 5" x 14" high—including unspillable accumulators which can be re-charged from a 12 volt car battery.
Digital and analogue recording facilities are available for use with the standard instrument.

* NO LEVELLING
* NO ZERO DRIFT
* NO CALIBRATION WORRIES
* NO HEAVIER THAN A PORTABLE TYPEWRITER
* HIGHLY ACCURATE
* QUICK DELIVERY

Write for details to:

Dept. MI, THE LITTLEMORE SCIENTIFIC ENGINEERING CO.

RAILWAY LANE, LITTLEMORE, OXFORD, ENGLAND
TELEPHONE AND CABLES: OXFORD 78563

Machinery and Equipment

Equipment for Gold Mine Winder Installation

The mechanical parts of a 16 ft. dia. double-drum winding engine which were ordered from The General Electric Co. Ltd. of England by the Doornfontein Gold Mining Co. Ltd. in South Africa are now approaching completion. This winder is to be fitted with two of the newly developed G.E.C. high-pressure brake engines, and these have recently been tested at the company's Erith works prior to shipment. A duplicate pair of brake engines is now under construction at Erith for a similar winder for the West Driefontein Gold Mining Co. Ltd., and these will also be shipped to Africa later this year.

The engines are the largest so far constructed for operation with a new and advanced high-pressure system which was designed at the Erith works and was first installed in 1960 at two British collieries. This system uses high-pressure oil in the range 3,000 to 6,000 lb./sq. in. and offers the dual advantage of accuracy of control under all operating conditions combined with speed of brake application in cases of emergency. The medium of high-pressure oil is used for both the application and release of braking torque, but nests of disc springs are incorporated to apply the brakes in the remote event of a complete pressure failure.

One of the two new G.E.C. high-pressure brake engines for Doornfontein Gold Mining Co. Ltd., of the Gold Fields Group, under test at the company's Erith works before shipment to South Africa. Both brake engines will be fitted to a new 16 ft. dia. double-drum winding engine, the mechanical parts of which are also being supplied by G.E.C. The specially built test rig enables the operation of the engine under site conditions to be simulated by the loading of a tension rod. A load of up to 40 tons can be directly applied by this size of brake engine to the rod, and the actual load induced can be measured by strain gauge equipment

LARGE N.C.B. CONTRACT

A major contract has been awarded to Qualter Hall and Co. Ltd. by No. 8 Area of the North Eastern Division of the National Coal Board. It concerns the design, manufacture and installation of skip winding and mine car winding equipment to handle coal at the two shafts of the new colliery at Kellingley, Yorkshire. The equipment is worth nearly £400,000.

Sinking of the two shafts was commenced just over a year ago and the first of the winding plants is scheduled to start operation in the summer of 1962. Shafts will be sunk to a depth of approximately 800 yds. and eventually the output of the mine is planned to reach 6,000 t.p.d. of saleable coal.

No. 1 (downcast) shaft is to be equipped by Qualter Hall for cage winding, for the transport of men, materials and dirt; 5 tons capacity mine cars are to be used, and mine car handling equipment is being provided initially on the surface and for two underground levels. Winding is contemplated from a third, lower level at a later date. The surface mine car circuit is compact and based on the use of continuously rotating flat deck turntables at the fulls and empties side of the shaft. The cages to be installed in the shaft will be designed to carry 120 men each when man-riding.

No. 2 (upcast) shaft is to be the coal winding shaft and will be equipped with two 15 ton capacity skips. A particularly noteworthy aspect of this plant is that the equipment to be installed has been specially designed to reduce the possibility of coal breakage to an absolute minimum. One of the most important features in this respect is the incorporation of a new type of skip loading equipment at each of the two underground loading stations. This equipment, consisting of a measuring pocket fitted with a spiral chute for lowering the coal, has recently been developed by Qualter Hall and has already been proved to be extremely effective in preserving large coal being loaded into skips. All the mine car handling equipment and skip plant will be electrically operated.

Four-rope friction winding using counterweights is being employed at both shafts, each of the two cages and skips with its counterweight forming a separate winding system. The winders and winding towers do not form part of the Qualter Hall contract, although they will be supplying the arrestor gear and counterweights.

FIRE EQUIPMENT

A versatile fire alarm indication console, designed and built by Private Telephone Department of Associated Electrical Industries' Telecommunications Division, is being shipped to India's new heavy electrical plant at Bhopal, in the setting up of which AEI is consultant.

The equipment provides visual and audible warning when a fire alarm is actuated; indicates the exact position of the alarm; retains a permanent record of the position and time at which the alarm was set off ,and enables warning sirens to be sounded individually, in "zone" groups, or throughout the Bhopal plant.

SOVIET SHAFT-SINKING MACHINE

It has been reported in *Soviet News* that an installation for sinking vertical shafts 16½ ft. in dia. and up to nearly 2,000 ft. deep is being built at the heavy machinery works in Zhdanov (Ukraine).

With this new installation the process of sinking shafts of large diameter is described as being fully mechanized and workers are relieved of ardous labour. Operations are based on the principle of core drilling and take place from the surface. The designed speed of drilling will be 120 to 150 m. a month. The machine can be used for sinking shafts in the hardest rocks, it is claimed.

NEW KITE-MARK LICENSEE

British Indicators (Sales) Ltd., have been granted a licence by the British Standards Institution to apply the Kite-mark to their range of dial gauges for linear measurement manufactured in accordance with B.S.907.

INTERCOMMUNICATION EQUIPMENT

An all purpose telephone has been added to the two-way range of intercom equipment made by D.J.P. Telephones Ltd. A composite design of equipments previously made only to special order, it is suitable for permanent siting in the open-air or for installing at sitings where manufacturing conditions causing dust, etc., prohibit the use of normal intercom.

A recently devised relay circuit allows perfect push button calling and talking over distances up to 7 miles. Twin core cable is used for interconnecting.

The instrument is housed in a heavy stove-enamelled case which has corner lugs for easy fixing. A hinged door provides permanent enclosure.

Professional Directory

DONALD GILL
Mining Engineer
535 Salisbury House, London, E.C.2
Tel.: National 0591

THE ABEM COMPANY
Geophysical Consultants and Contractors
Airborne Electromagnetic, Magnetic, and Radiometric Surveys
All types of ground geophysical surveys
Seismic investigations on land and water
Manufacturers of a complete range of geophysical instruments
Danderydsgatan 11, Stockholm, Sweden
Cables : Prospecting
Telex : 1459 Tel.: 23 02 55

JOHN A'C. BERGNE
A.R.S.M., M.I.M.M.
Mining Engineer
539 Salisbury House, London, E.C.2.

S. H. GLASSMIRE & ASSOCIATES
CONSULTING
GEOLOGISTS • ENGINEERS
214 COLLEGE STREET, SANTA FE, N.M. U.S.A.
Offering Professional Services in
LATIN AMERICA
Mineral Examinations, Inspections, Evaluations. Reports and applications for private and Government financing.

AB SWEDISH GEOPHYSICAL SURVEY
Airborne magnetic and electro-magnetic surveys. Airborne radio-active spectrometrie. Ground surveys.
Alströmergatan 16, Stockholm K, Sweden
Cables : Airexplore
Tel.: 54 74 78, 54 74 79

BEWICK, MOREING & CO.
Consulting Mining Engineers and Mine Managers
84-90 CHISWELL STREET, LONDON, E.C.1
Cables : Bewick Tel : Moorgate 9691
Branches at
Johannesburg, S. Africa. Perth, Australia

DANIEL C. GRIFFITH & CO. LTD.
Assayers to the Bank of England
Analytical Chemists, Samplers, Technical representatives in sales of Ores and Metals at U.K. and European Ports and Works
Sampling and Analyses of
Precious Metals, Rare Earths, Base Metals, Ores and Residues, Etc.
27/33, Paul Street, London, E.C.2
Tele: MONarch 1314 (3 lines)
Cables: Gryffydd, London

AEROFALL MILLS LIMITED
ORE DRESSING ENGINEERS
129 Adelaide St. West TORONTO, CANADA

Boland Development Company Ltd.
Mining Engineering Contractors
Head Office: Suite 505, 100 University Ave., Toronto, Ont. Tel.: EM. 4-0119
Branch Offices: P.O. Box 432, Noranda, Que. Tel.: RO. 2-4865
P.O. Box 352, Butte, Montana, U.S.A. Tel.: 5144
C. S. Boland, P.Eng., Ontario & Quebec President & General Manager

HEATH & SHERWOOD CHEMICAL GROUTING LIMITED
Cable Address Sherdrill
6-8 Hudson Bay Avenue, Kirkland Lake Ontario, Canada

Aero Service (Bahamas) Ltd.
Complete airborne geophysical and mapping service, including more than a million miles experience throughout the world, with Gulf magnetometer, Newmont electro-magnetic detector, and National Research Council scintillation counter.
Also : photo-geologic studies, Shoran surveys, resources inventories.
Avenida del Generalisimo 53-1°C, Madrid 16, Spain
210, East Courtland Street, Philadelphia 20, PA., U.S.A.

COOKE, EVERETT & ASSOCIATES, INC.
Geologists Engineers Geochemists
MINING—PETROLEUM—GROUND WATER
Resources—Exploration—Valuation Utilization—Marketing—Investments Research—Translations—Photogeology Geophysics—Engineering Geology
MINES REGISTRY ASSOCIATES
421 Court St. P.O. Box 2229
Reno, Nevada, U.S.A. Cable : COVER
OFFICES : Calif.—N.M.—N.Y.—Ore.—Wash. D.C.—Argentina—Canada—India—Peru

HEATH & SHERWOOD DRILLING (EASTERN) LIMITED
Domestic diamond drill contracting and management
Cable Address : Sherdrill
6-8 Hudson Bay Avenue, Kirkland Lake, Ontario, Canada

AUTAIR LTD.
Contract Aviation Services
Complete aeronautical services with helicopters and STOL aircraft for field operations and exploration.
75 Wigmore Street, London, W.1.
Telephone : Welbeck 1131
and at
P.O. Box 2867, Salisbury S. Rhodesia

DUNCAN R. DERRY
CONSULTING GEOLOGIST
Room 602 · 217 Bay Street, Toronto, Ontario, Canada
Tel. OFFICE – EMPIRE 3-6528
HOME – CRESCENT 8-2524

HEATH & SHERWOOD DRILLING S.A. LIMITED
Foreign diamond drill contracting and management
Cable Address : Sherdrill
Bank of Bermuda Building, Hamilton, Bermuda

HILL & MORRIS

MINING & EXPLORATION ENGINEERS

Edificio Pestrada No. 702
Medellin (Ant.) Colombia. S.A.
Apartado Aereo 1209

Cables : Minhill Telefono 113-59 Medellin

KNAPP & BATES LTD.

Ore Dressing Engineers

**14-17, Finsbury Court,
Finsbury Pavement,
London, E.C.2**

Tel.: MON 0840 Cables: Flowsheet, London

ARTHUR NOTMAN

Consulting Mining Engineer

**55 Liberty Street, 18th Floor,
New York 5, N.Y., U.S.A.**

Telephone : BArclay 7-9484

HUNTING SURVEYS LIMITED

SURVEYORS, PHOTOGRAMMETRIC ENGINEERS AND CONSULTANTS AIRBORNE AND GROUND GEOPHYSICAL SURVEYS AND SERVICES

**6 Elstree Way.
Boreham Wood, Herts.**

Tel.: Elstree 2214 Cables: Asterео

London Office :
4 Albemarle Street, London, W.1.

**LAKEFIELD
RESEARCH OF CANADA LIMITED**

Metallurgical and Chemical Research—Ore Testing

Analysis and Assaying

**P.O. Box 430,
Lakefield, Ontario, Canada**

Phone : OLiver 2-3341

POWELL DUFFRYN TECHNICAL SERVICES LIMITED

Consulting Engineers
(Mining, Chemical, Industrial)

**7/17 Jewry Street
London, E.C.3**

Cables: Technicoal
Telephone: ROYal 0141

HUNTING TECHNICAL SERVICES LIMITED

Geological Mapping and Mineral Exploration. Photogeology. Geophysics. Geochemistry. Aerial and Ground Surveys.

**6 Elstree Way,
Boreham Wood, Herts.**

Telephone : Elstree 2214. Cables : Hunteco, London

London Office:
4, Albemarle Street, London, W.1.

LEA CROSS GEOPHYSICAL CO. LTD.

Gravity, Magnetic & Electro-Magnetic Surveys

Geochemical Surveys and Analysis

HANWOOD, SHREWSBURY, ENGLAND
Tel.: Hanwood 296

JOHN TAYLOR & SONS

Mining Engineers, Consultants and Mine Managers

Technical Buying and Shipping

**Suffolk House,
5, Laurence Pountney Hill,
London, E.C.4**

Cables: Rolyat, Cent, London
Tel.: MINcing Lane 7351 (3 lines)

A. W. JOHNSTON

Geologist, P.Eng.

**16th Floor
100 Adelaide Street West,
TORONTO 1**

Phone EM. 3-1493

LEDOUX & COMPANY, (INC.)

Metallurgical Chemists — Assayers
Samplers, Weighers and Inspectors

Chemical & Instrumental Analysis of Ores, Concentrates and Metals

Method Research & Development

**359 Alfred Avenue
Teaneck, N.J., U.S.A.**

WRIGHT ENGINEERS LIMITED

**Metallurgical, Mining and Industrial Plants, Marine Terminals
Bulk Handling Facilities
Economic Studies, Complete Design**

850 WEST HASTINGS STREET
VANCOUVER 1
BRITISH COLUMBIA

Telephone : MUtual 3-7595
Cables : "Metwright"

W. P. JOHNSTON

Consulting Mining Geologist

Specializing in valuation of Ore Deposits of the Western United States

**210 West Second Street,
Reno, Nevada**

Tel : Office — FAirview 9 2302
Home — FAirview 2 0751

McPHAR GEOPHYSICS LIMITED

Geophysical Surveys and Electrical Prospecting Equipment

Including
INDUCED POLARIZATION AND AUDIO FREQUENCY MAGNETICS

**139 Bond Avenue, Don Mills,
Ontario, Canada**

Cable: "McPhar Toronto"

*This feature
appears every
fourth week*

The Mining Journal . **ANNUAL REVIEW — 1961 EDITION**

Summarizes events and statistics of 1960

Now on Sale — Price 25/-

Orders may be placed through Newsagents or sent direct to :

THE PUBLISHER, The Mining Journal, 15 Wilson Street, Moorgate, London, E.C.2

EASTERN SMELTING CO. LTD

TIN SMELTERS

Head Office:

ST. SWITHIN'S HOUSE

11/12 ST. SWITHIN'S LANE, LONDON, E.C.4 TELEPHONE: MANSION HOUSE 2164/8

Smelting Works:

PENANG, FEDERATION OF MALAYA

Branches throughout the Federation of Malaya

Penang Office and Works:

DATO KRAMAT ROAD, PENANG

Selling Agents:

VIVIAN, YOUNGER & BOND LTD

PRINCES HOUSE, 95 GRESHAM STREET, LONDON, E.C.2

TELEPHONE: MONARCH 7221-7 TELEGRAMS: BOND, STOCK, LONDON TELEX: LONDON 8665 CABLES: BOND, LONDON

NON-FERROUS METALS
ORES AND MINERALS
IRON AND STEEL

HENRY GARDNER & CO. LTD.

Members of the London Metal Exchange and :: suppliers to markets all over the world ::

Cables:
Nonfermet London

Telex:
London 28547

Telephone:
Mansion House 4521

Head Office:
2 METAL EXCHANGE BUILDINGS
LEADENHALL AVE. LONDON, E.C.3

AYRTON & PARTNERS
LIMITED

★

NON-FERROUS METALS
ORES
MINERALS AND RESIDUES

★

IMPERIAL HOUSE
DOMINION ST., LONDON, E.C.2

TELEPHONE: MONarch 7541
TELEX: LONDON 2-2475 CABLES: PARTONAYR

Metals and Minerals

Chromite Still in Limited Demand

Trade in chromite was substantially greater in 1960 than in 1959, reports the *Commodity Survey 1960* issued by the United Nations (Sales No. 61.11d.1). During the first half of 1960 shipments from Southern Rhodesia and Turkey were more than an eighth higher than in the corresponding portion of 1959. This expansion was easily absorbed by existing capacity, however. In fact, rates of industrial absorption continued to lag behind potential production. As a result, the prices at which chromite moved in international trade were appreciably lower than in 1959. A decline of about 11 per cent was registered in the U.S. import unit value of chromite—Cr_2O_3 basis. Judging by average unit values, states the report, the decline was less than this in the case of Rhodesian sales and slightly greater in the case of Turkish sales.

Despite the high level of world steel production, chormite still remains a dull market and seems likely to remain so until the U.S. returns to the market as a really worthwhile buyer. In this connection it is noteworthy that U.S. steel production has risen for the eleventh successive week. Good tonnages are being delivered to European consumers under contract, but the weight of demand for supplies additional to these contractural obligations remains unimpressive, though signs of some improvement have recently been reported. Sales to Japan continue to be made and reasonable quantities are being shipped to the U.S. Competition for the available business, however, is said to be keen and supplies of Russian material continue to be encountered, especially in certain countries such as Sweden and France. It is believed that the Soviet Union is now producing a lumpy ore which is more suitable for many buyers' needs.

*

Output of Turkish chrome ore mines under the control of the Eti Bank in 1960 was 181,422 tons of which 141,520 tons were exported compared with an output of 109,232 tons in 1959 when exports amounted to 111,290 tons (including some 1958 stocks).

The private sector produced some 300,000 tons in 1960 of which 253,200 tons were exported bringing the total Turkish chrome ore exports to 394,730 tons compared with roughly 307,400 tons in 1959.

Main exports of the private sector in 1960 included (in tonnes): U.S. 65,338, West Germany, 74,862, France 36,181, U.K. 20,879, Norway 11,124, Austria 13,270, Italy 8,437, Switzerland 8,950 and Spain 7,800.

Turkish chrome ore exports to the United States and Spain totalled 31,300 tons during the first two months of this year compared with 57,000 tons during the corresponding period of 1960, according to the Turkish Chrome Ore Committee.

The government is reported to have prevented the conclusion of the agreement entered into with the U.S. in April concerning the shipment of 200,000 tons of chrome ore to the U.S. against U.S. wheat and rice.

An official government spokesman said that Turkey was not prepared to barter important strategic commodities such as chrome ore against food but was only prepared to sell them for dollars or Turkish currency. The wheat and rice under the deal will therefore be paid for in Turkish pounds into the U.S. account at the Turkish Central Bank.

*

An agreement for the supply of 11,500 tons of chrome from Rhodesia has been concluded by Nippon Kokan Kaisha. The company apparently intends to increase imports of chrome ore from Africa, provided that prices remain reasonable and quality high. This trade would replace snipments now obtained from the Philippines.

Meanwhile, a delegation of representatives from the Japanese ferro chrome industry is to visit the Philippines at the request of the Acoje Mining Co. and the Nanyo Bussan Trading Co. of Japan which imports Philippine ore. At present Japan imports between 120,000 and 150,000 tons of chrome ore annually from Acoje.

LONDON METAL AND ORE PRICES, JUNE 8, 1961

METAL PRICES

Aluminium, 99.5%, £186 per ton
Antimony—
English (99%) delivered, 10 cwt. and over £230 per ton
Arsenic, £400 per ton
Bismuth (min. 1 ton lots) 16s. lb. nom.
Cadmium 11s. 0d. lb.
Cerium (99%) net, £15 0s. lb. delivered U.K.
Chromium, Cr. 99% 6s. 11d./7s. 4d. lb.
Cobalt, 12s. lb.
Germanium, 99.99%, Ge. kilo lots 2s. 5d. per gram
Gold, 251s. 4½d.
Iridium, £20/£23 oz. nom.
Lanthanum (98%/99%) 15s. per gram.
Magnesium, 2s. 2½d./2s. 3d. lb.
Manganese Metal (96%/98%) £275/£285
Nickel, 99.5% (home trade) £600 per ton
Osmium, £18/£22 oz. nom.
Osmiridium, nom.
Palladium, Imported, £8 12s. 6d.
Platinum U.K. and Empire Refined £30 5s.
Imported £28/£28½
Quicksilver, £67 ex-warehouse
Rhodium, £43/£45 oz.
Ruthenium, £14/£16 oz. nom.
Selenium, 46s. 6d. per lb.
Silver, 79¼d. f. oz. spot and 80d. f'd.
Tellurium, 37s. 6d. lb.

ORES AND OXIDES

Antimony Ore (60%) basis	30s. 0d./35s. 0d per unit c.i.f.
Beryl (min. 10 per cent BeO)	270s./275s. per l. ton unit BeO
Bismuth	30% 5s. 0d. lb. c.i.f.
	20% 3s. 3d. lb. c.i.f.
Chrome Ore—	
Rhodesian Metallurgical (semifriable 48%) (Ratio 3 : 1)	£15 5s. 0d. per ton c.i.f.
" Hard Lumpy 45% (Ratio 3 : 1)	£15 10s. 0d. per ton c.i.f.
" Refractory 40%	£11 0s. 0d. per ton c.i.f.
" Smalls 44% (Ratio 3 : 1)	£13 5s. 0d. per ton c.i.f.
Baluchistan 48% (Ratio 3 : 1)	£11 15s. 0d. per ton f.o.b.
Columbite, Nigerian quality, basis 70% combined pentoxides (Ratio 10 : 1) Nb_2O_5 : Ta_2O_5	165s./167s. 6d. per l. ton unit c.i.f.
Fluorspar—	
Acid Grade, Flotated Material	£22 13s. 3d. per ton ex. works
Metallurgical (75/80% CaF_2)	156s. 0d. ex. works
Lithium Ore—	
Petalite min. 3½% Li_2O	50s. 0d./55s. 0d. per unit f.o.b. Beira
Lepidolite min. 3½% Li_2O	50s. 0d./55s. 0d. per unit f.o.b. Beira
Amblygonite basis 7% Li_2O	75s./85s. per ton f.o.b. Beira
Magnesite, ground calcined	£28 0s./£30 0s. d/d
Magnesite Raw (ground)	£21 0s./£23 0s. d/d
Manganese Ore Indian—	
Europe (46%/48%) basis 60s. 0d. freight	73d./75d. c.i.f. nom.
Manganese Ore (43%/45%)	69d./71d. c.i.f. nom.
Manganese Ore (38%/40%)	nom.
Molybdenite (85%) basis	8s. 11d. per lb. (f.o.b.)
Titanium Ore—	
Rutile 95/97% TiO_2 (prompt delivery)	£23½ per ton c.i.f. Aust'n
Ilmenite 50/52% TiO_2	£11 10s. per ton c.i.f. Malayan
Wolfram and Scheelite (65%)	123s. 6d./127s. 6d. per unit c.i.f.
Vanadium—	
Fused oxide 95% V_2O_5	7s. 6d./8s. per lb. V_2O_5 c.i.f.
Zircon Sand (Australian) 65-66% ZrO_2	£16 ton c.i.f

RARE EARTH METALS

Johnson Matthey announce that they are now able to supply scandium, yttrium, and most of the fourteen rare earth metals in sheet form in thicknesses down to 0.001 in. and with a maximum width of 3 in. The sheet is available either cold worked or annealed. This is the latest development in the company's production of the metals of this group, which have previously been available as ingots and in some cases as wire of diameters down to 0.02 in.

KAISER RE-OPENS ANOTHER POTLINE

Kaiser Aluminium has re-opened yet another potline at its Mead, Washington, plant, thereby increasing output to about 85 per cent of capacity. In the past six weeks Kaiser has restarted seven other potlines. In mid-April, its production was about 52 per cent of capacity. The latest re-opening is doubtless attributable to the uptrend in aluminium sales.

On the basis of April and May business, plus the foreseeable outlook for June, it is generally anticipated in the U.S. aluminium industry that second quarter business will exceed the first by more than 10 per cent. While the possibility of some slackening of demand in certain areas during the third quarter is conceded, the consensus of opinion is that the uptrend will continue throughout this year and into 1962.

*

The Yawata Iron and Steel Co., which announced some weeks ago that it was planning to start aluminium production jointly with other Japanese firms, is reported to be negotiating with Kaiser Aluminium for technical assistance and for a capital tie-up. Under the plan, Kaiser would hold one-third of the stock

of the new company, which would have a capital of £2,000,000. Yawata Iron and Steel would hold a third and the other two companies, the Nisso Steel Manufacturing Co. and Kinoshita Sansho Kaisha, a third between them. The new company will build a plant in Central or Eastern Japan, which by 1963 is expected to be producing primary aluminium at the rate of 25,000 tonnes a year. Production capacity is to be expanded to 40,000 t.p.a. by 1966.

★

A four-man fact-finding team from the U.K. and Canada has arrived in Sydney to investigate the establishment of an aluminium smelter and an aluminium plant in Australia. They are experts from Aluminium Ltd. and British Aluminium Co. Ltd. owners of the Australian Aluminium Co. Ltd. Hitherto, the latter concern has been purely a fabricating company.

U.S. MOLYBDENUM PRICE INCREASES

Climax Molybdenum Co., a division of American Metal Climax Incorporated, increased the prices of its molybdenum products by an average of ten per cent as from June 1. This is the first price increase in molybdenum products since November 1, 1958, when prices were increased by an average of 5 per cent.

The new prices include: Molybdenum concentrate $1.40 per lb., up 15 c.; canned molybdic oxide $1.60 per lb., up 13 c., and ferromolybdenum $1.89 per lb., up 13 c. The price increases are said to be mainly due to higher costs that stemmed from wage increases as well as to higher prices for services and supplies.

U.S. MAGNESIUM OUTPUT FALLS

Commercial production of primary magnesium in the U.S. during the first quarter of this year was 9,990 tons, 730 tons less than in the final quarter of 1960, according to the U.S. Bureau of Mines. The Dow Chemical Co. plant at Freeport, Texas, the Alabama Metallurgical Co. plant at Selma, Ala. and the government-owned plant at Canaan, Conn., produced primary magnesium throughout the period. Titanium Metals Corp. continued to recycle magnesium as an integrated operation of its production of titanium at Henderson, Nev.

RENEWED DEMAND FOR WOLFRAM

The first signs of a recovery in the market for wolfram have been in evidence over the past fortnight. On June 5 wolfram ore shipment prices were indicated by dealers at 123s. 6d. to 127s. 6d. per l.ton c.i.f. Europe compared with 121s. to 126s. previously and, unless the current supply position undergoes a radical change, the upward price movement is expected to continue for some time. Increased demand for high quality ore has been particularly brisk.

The rise in price has not yet made good the sharp fall which occurred during the first quarter of this year when prices had declined by around 30s. below the year end price level. This fall was mainly due to sales of wolfram from the Soviet *bloc* suppliers at unusually heavy discounts on the price ruling in London. Since March, however, supplies from this quarter seem to have slackened off. Furthermore, supplies of scheelite from South Korea have been less plentiful. At the same time up to a fortnight ago any shortfall in supplies appears to have been made good by sales from the government stockpile, but to a decreasing extent than earlier in the year.

On the supply side it is significant that Korea is still in the throes of a tungsten export dispute. The concession held by the Continental Ore Corporation, United States, for the export of the tungsten mined by the government-owned Korean Tungsten Mining Corporation (KTMC) expired in January. In addition to the former concessionaire, two other companies, the Tokyo Food Co., Japan, and Philipps Bros., U.S. competed for the new contract. The announcement by the president of the KTMC of the decision to award the contract to the Japanese firm aroused bitter opposition on political grounds and the government withheld its approval of the award.

As an interim measure pending settlement of the issue an open bidding was held for the export of 400 tons of tungsten ore. The success of the Tokyo Food Co. in this bidding drew allegations of bribery from the National Assembly member against one of the Ministers Without Portfolio. A special committee was set up by the National Assembly to investigate the case and the subsequent revelations of collusion between the KTMC and the Japanese firm became the subject of a major political dispute. The issue was still deadlocked at the end of the quarter and tungsten exports had come to a standstill. In 1960 the KTMC produced 4,656 tons of tungsten ore and exported 4,938 tons for $5,467,000. Tungsten is the country's most valuable export commodity.

CHINESE SELL MORE SILVER

As foreshadowed in *The Mining Journal*, March 10, 1961, p. 259, the Chinese have been stepping up their sales of silver to the West since February.

Little interest is being shown in spot silver on the London market which is now 79 3-8d. while the price for forward delivery is 79¾d. per oz. In the U.S. the fixed Treasury purchase price of 90½ c. per oz. has fallen below the current free market price. Thus already Chinese sales are exerting a depressing influence on prices.

Copper · Tin · Lead · Zinc

(From Our London Metal Exchange Correspondent)

On June 1 Mr. James D. Wolff announced his retirement from the chairmanship of the board of the Metal Market and Exchange Co. Ltd. and also as a member of its board. This marks the end of an association with the Exchange which has lasted since 1904. Mr. Wolff was chairman of the committee from 1928 to 1950 with a break of only one year in 1944, and he was chairman of the board from 1946 until his resignation. Mr. Wolff is one of the last of those who did so much to keep the spirit of the Exchange alive during the war and subsequent years before the market was re-opened in 1949. He was one of the leading negotiators with the government in respect of the re-opening of the markets, and the fact that today the Metal Exchange is a thriving institution owes a lot to his untiring energies. He will be sadly missed, but the Exchange is extremely fortunate in having as his successor Brigadier H. Crosland, C.B.E., M.C., T.D., D.L., who has himself been a pillar of strength to the Exchange for many years.

The period under review has been marked by a weakening in the undertone in all metals except tin, but most observers feel that the fall in prices is now discounting a slackening in demand due to the coming holiday season, and that although markets may show no improvement for some weeks they have now reached a point from which an upward movement is likely to commence as soon as any buying develops.

L.M.E. COPPER PRICE DECLINES

There has been little alteration in the world price structure of copper except that the Belgian price has been reduced from about 30.62 c. per lb. to about 30 c. per lb. Antwerp or New York, and the U.S. custom smelter intake price for scrap has been slightly weaker at 26½ c. per lb. In London the price has declined owing to hedge selling and profit-taking, and it can be that prices will go down a little further before the intrinsically sound position of the metal exerts itself.

There has been no news of the negotiations between Kennecott and the Unions, and opinion seems to be equally divided on the likelihood of a strike. Consumer demand in the United States continues at a fair level, whilst the Japanese are still in the market for copper wire bars at an appreciable premium over the standard price.

In the U.K. demand is uninteresting, stocks rose by 60 tons at the beginning of the week to a total of 16,527 tons. At the same time the contango shows signs of widening.

CASH TIN JUST UNDER CEILING

The tin market has once more been spotlighted with a strong advance in the three months quotation due to increased interest being shown by consumers throughout the world. At the same time there has been a little spectulative buying following rumours that the whole price structure of the second International Tin Agreement will be raised, but it should be pointed out that these rumours appear to originate in countries which have an interest in such a move. In any case, the second International Tin Council must consider the price structure at their first meeting, which is scheduled for early July. It is very unlikely, however, that any hasty action will be taken which is against the interests of consumers and if it is of sufficient magnitude might do harm to the whole future of the tin industry through encouraging substitution. On Wednedsay afternoon the chairman of the I.T.C.

stated publicly that no decision on prices had taken place at the Council's recent meeting.

Although the forward quotation has been strong, the cash quotation has remained just below £880 per ton at which the buffer stock manager must sell. Up to the time of writing the tonnage he has had to supply to the market has been small. The decrease in stocks continued as the figure at the beginning of the week totalled 8,909 tons, a fall of 263 tons as compared with the previous week. The contango has widened considerably and most observers expect that this will reach £13-14 per ton before it becomes stabilized.

Shipments of tin from Penang in May totalled 6,294 tons, whilst shipments from Singapore totalled 499 tons. At the same time it is announced that production last month was a trifle down at 4,436 tons and that the stocks of metal and metal-in-concentrates at the end of April also showed a decline from the end of March figures. It must be realized that it takes a long time for a better price to bring about the re-opening of old workings, but it is considered that if the present price is maintained then plans will go ahead which will result in an appreciable increase in production next year.

On Thursday the eastern price was equivalent to £900¾ per ton c.i.f. Europe.

LEAD-ZINC PRICES NEAR FLOOR?

The lead market has remained relatively steady, but the zinc market has been subjected to increasing selling pressure and prices have declined. Yet both metals seem to be approaching a level at which buying will be stimulated, especially in the case of lead, as it seems unlikely that prices will decline very much further. The zinc position is the more unsatisfactory, as high grade zinc in the United States is still being sold at a discount from the official price and there are appreciable tonnages of metal from behind the Iron Curtain resulting from barter which must be absorbed in the near future. Stocks of lead rose 19 tons to a total of 11,618 tons and stocks of zinc rose 694 tons to a total of 7,911 tons.

OFFICIAL TURNOVERS

Official turnovers (in l.tons) for the week ending June 2, with the previous week's figures in parentheses, are :—

Copper	13,975	(16,125)
Tin	885	(695)
Lead	7,350	(7,500)
Zinc	6,150	(6,375)

Closing prices are as follows :

	June 1		June 8	
	Buyers	*Sellers*	*Buyers*	*Sellers*
Copper				
Cash	£240	£240½	£238	£238½
Three months ..	£242½	£242½	£240½	£240½
Settlement ..	£240½		£238½	
Lead				
Current ½ month	£65½	£65½	£64½	£64½
Three months ..	£66½	£66½	£66	£66½
Tin				
Cash	£869½	£870	£879½	£880
Three months ..	£876	£876½	£890	£891
Settlement ..	£870		£880	
Zinc				
Current ½ month	£81½	£81½	£80½	£80½
Three months ..	£82½	£82½	£81½	£81½

London Metal and Ore Prices appear on page 669.

Mining Finance

Is There a Threat to the Industrial Diamond Market?

Since 1947 there has been a very significant expansion in the industrial diamond sales of the Central Selling Organization. In 1947 the total value of these sales was less than £5,000,000 whilst in 1959 it was £28,100,000. The expansion during this period was not uniform but the reversals that occurred could be linked directly with industrial recession.

This trend of expansion has not been maintained since 1959 and the reversal comes when the new competitive aspect, introduced by the production of synthetic diamonds by General Electric of Amercia, is much in the foreground. This competitive aspect has been highlighted by the decision of the Central Selling Organization to discontinue the practice of giving separate results for gem and industrial sales.

The question which must arise from the point of view of the diamond producers—especially those whose main production falls into the industrial category—is how much of this change of market condition is a function of competition from synthetic stones and how much from other causes?

In considering this question it is important to appreciate that today 'industrial diamonds' is an expression that covers a very wide range of materials. In fact, the synthetic stone is only a competitor—at present—in one particular range, the needle-like shapes used primarily in resin bonded tools. Within this range the General Electric production of some 3,500 cts. is a significant contribution to the world requirements, but as this material is one of the least expensive on a per carat basis it is not sufficient to account for the reversal in the trend of expanding revenue.

Diamonds must have suffered, as have most other raw materials, from the recent North American industrial recession but probably the most important single item is the cessation of stockpiling of the U.S. government for strategic purposes. In his annual statement in 1959 Mr. H. F. Oppenheimer made the point that the recovery at that stage was strongly influenced by the renewed stockpiling by the American government. Again the government has withdrawn from the market and it must therefore be assumed that this is largely responsible for the market trend.

The American stockpile must by now have reached enormous proportions and whilst there is little fear that this will be sold on the market it must be assumed that the government is no longer a prospective buyer. The late Sir Ernest Oppenheimer was very conscious that this problem would arise and in fact warned shareholders on several occasions prior to 1956.

The Diamond Research Laboratory was established fourteen years ago and the net increase in actual industrial consumption is largely the result of its work. Recently new natural diamond grits have been produced by the laboratory for use both in metal bonds and resin bonds and tests have shown that, in resin bonded wheels for example, grinding efficiency has been improved by as much as 40 per cent with the resultant savings in production costs. This type of advance and the effective reduction in the cost of using diamond tools must widen the market for industrial diamonds and it is in this field that the producers must look for a market to replace the U.S. government buying.

Looking to the future there is every reason to expect the market to continue to expand at much the same rate as in the past though it may be two or three years before the growth trend increases sufficiently to replace the loss of sales to the U.S. government stockpile, and thus overtake the 1959 record level.

A DIFFICULT YEAR FOR BECEKA

Despite the troubled conditions in the Kasai province of the Congo, Société Minière du Bécéka maintained a high diamond output in 1960. At approximately 13,100,000 carats the production was less than 8 per cent below that of the previous year. This is an outstanding achievement. In their report, translated extracts from which appear on page 676, the directors pay tribute to the 30 volunteers who guarded the plant and equipment and were largely responsible for the rapid manner in which the Société was able to resume operations.

As a result of this rapid recovery and high operating level before July 1960 the operating results for Bécéka in 1960 have improved from F. 669,726,118 to F. 890,227,864 and the revenue from investments has increased by F. 45,595,227 to F. 309,388,797. However, the net profit has remained substantially the same, the additional expenditure being mainly against amortization.

GOPENG LOOKS 25 YEARS AHEAD

It has been long considered that the properties of Gopeng Consolidated, the Malayan tin producer, offered one of the lengthiest lives of any of the companies in this part of of the world. And little could be more important these days than having existing tin-bearing ground which offers potentially profitable operations for even ten years ahead. The reason, of course being that in Malaya, as throughout most of the rest of the world, new tin deposits are becoming increasingly difficult to find.

Stockholders in Gopeng should thus seize on the words of the chairman, Mr. W. E. Hosking, when he says in his statement with the report for the year to last September that "as far as it is possible to estimate at present the life of the merged properties appears to be not less than 25 years". This can almost certainly be regarded as a conservative estimate. So buyers of Gopeng 3s. 6d. stock units—shortly to be written up to 5s. by capitalizing part of the share premium account—have one vitally important factor about which they need not have the slightest worry.

Apart from this the outlook is cheerful enough as outlined here a fortnight ago when discussing the preliminary figures. Mr. Hosking confirms that complete integration of the enlarged properties is a long-term project and that some time must elapse before it is accomplished. This indicates that increas-

COMMONWEALTH OF AUSTRALIA
DEPARTMENT OF NATIONAL DEVELOPMENT

MINERAL ECONOMISTS

The BUREAU OF MINERAL RESOURCES is seeking the services of Mineral Economists for its Mineral Economics Section, Mineral Resources Branch, Canberra, Australia.

Vacancies exist for the following :

Designation	Salary Ranges (Aust.)
Mineral Economist Grade 1 :	£1,290-£1,620
Mineral Economist Grade 2 :	£1,620-£1,730
Mineral Economist Grade 3 :	£1,730-£1,950

DUTIES

Grade 1—Assist in collection and collation of data, relating to all aspects of the mineral industry, for use in Mineral Economics Section; generally assist in the Section's work.

Grade 2—Continuing studies of specified mineral commodities; preparation and analysis of basic data for use in investigations of the economics of the mineral industry; assist in preparation of the Section's publications.

Grade 3—Continuing studies of specified mineral commodities including production, consumption and overseas trade situations; carry out independent investigations relating to the economics of certain aspects of the mineral industry; assist in preparation of the Section's publications.

Grade of position and commencing salary will be determined by the applicant's qualifications and experience. Minimum academic qualifications required are :

University degree in science or engineering (mining or metallurgy); or such other qualifications and experience as are considered suitable.

Salary will be paid to successful applicants from the date of embarkation at U.K. (or other overseas) port. Fares of successful applicants and those of their families (if any) will be paid subject to the applicant completing a bond of service to remain in the service of the Commonwealth for at least three years.

Application forms and further particulars from :
Official Secretary, Australia House (Ref. 60/7419), Strand, London, W.C.2.
Applications close on 26th June, 1961.

ECONOMICS OF SOUTH AFRICAN GOLD MINING

by

R. E. WALLACE and A. S. ROBERTSON

With illustrations by JOHN L. TURNER

THIS book (now available for the first time at a "popular" price) has been specially written for the non-technical mining investor by two Johannesburg accountants in collaboration with a geologist and a mining engineer. It explains how to make full use of the wealth of geological, mining and statistical data, published monthly and quarterly, by the South African groups.

Such information, which is almost invariably reported and commented on in the financial and mining press, often presupposes a degree of knowledge not only of geology and of the techniques of prospecting and mining but also of the limits of economic mining and of the mathematics of share valuation, which many investors do not possess. It is this knowledge which *Economics of South African Gold Mining* supplies.

This book tips no shares, nor does it set out to evaluate the prospects for any particular mine. Its sole purpose is to present the essential background knowledge without which a considered view of this or that South African gold mining share is not possible. It does so in terms which the lay investor can understand, yet in sufficient detail to enable him to put the principles involved to practical use.

PRICE 12s. 6d.

Obtainable from

The Mining Journal, 15 Wilson Street, London, E.C.2.

SELECTION TRUST

Mining Finance and Exploration

RESULTS FOR YEAR ENDED 31st MARCH, 1961

	£	(1960) £
Revenue, less expenses, of the Company and its Subsidiaries was	3,497,330	3,136,158
Taxation amounted to	1,610,746	1,358,776
leaving	£1,886,584	£1,777,382
which has been applied as follows :—	£	£
Transfers to Reserves and addition to Unappropriated Profits	746,049	636,847
Preference Dividends, net	27,563	27,563
Ordinary Dividends (7s. per stock unit), net	1,112,972	1,112,972
	£1,886,584	£1,777,382

Exploration Expenditure of £359,881 (*1960—£240,122*) was charged to Exploration Reserve.

Depreciation of £196,287 in the value of Investments (*1960—£170,628*) was charged to Investment Reserve.

CONSOLIDATED FINANCIAL POSITION

CAPITAL AND RESERVES	£	£
Issued Capital, 5,191,711 stock units of 10s.	2,595,856	2,595,856
Reserves and Unappropriated Profits	4,904,886	4,661,531
Outside Interests in Subsidiaries	1,833,703	1,181,314
Debenture Stock outstanding	121,892	128,277
	£9,456,337	£8,566,978
ASSETS	£	£
Quoted Investments at book value	5,047,591	4,720,280
Unquoted Investments at book value	523,466	898,117
Net Current Assets	2,186,751	2,800,877
Mining and Freehold Property and other assets	1,698,529	147,704
	£9,456,337	£8,566,978

The quoted investments appearing at £5,047,591 had a market value on the basis of Stock Exchange prices at 31st March, 1961, of £27,942,035.

The unquoted investments appearing at £523,466 included the holding in Tsumeb Corporation, which stands in the books at £35,639 but which, valued on an arbitrary basis, is worth about £4,000,000.

INVESTMENTS

Selection Trust is principally interested, directly and indirectly, in the following companies :

American Metal Climax
Bikita Minerals
Chibuluma Mines
Consolidated African Selection Trust
Mufulira Copper Mines
Rhodesian Selection Trust
Roan Antelope Copper Mines
Sierra Leone Selection Trust
Tsumeb Corporation
Vaal Reefs Exploration and Mining Company
Western Decalta Petroleum
Western Holdings

EXPLORATION

The principal exploration activities are centred in Canada and Africa and conducted mainly by two Subsidiaries :—

Selco Exploration Company Ltd., Suite 600, 77, York Street, Toronto.

African Selection Trust (Pty.) Ltd., 733, "Libertas", 62, Marshall Street, Johannesburg.

Copies of the Annual Report for the year ended 31st March, 1961, may be obtained at the Company's Transfer Office at 107 CHEAPSIDE, LONDON, E.C.2.

The Annual General Meeting of Selection Trust Limited will be held at 12 noon on 29th June, 1961, at SELECTION TRUST BUILDING, MASON'S AVENUE, LONDON, E.C.2.

ing officiencies should be the order of the day at Gopeng which makes the units, even at their considerably enhanced price of 44s.—they have been up to 51s. in the recent tin share surge— one of the best long-term lock-ups in the whole of this particular market.

A NOTABLE YEAR FOR SELECTION TRUST

There are bound to be those who have been disappointed that the Selection Trust dividend has not been increased this year following the increase in revenue from both its American and West African holdings. However, Selection Trust's policy has been one of maintaining a stable dividend and it is to the credit of the company that it has been able to do so in previous years when the outlook for base metals has been far less promising.

The year ended March 31, 1961, has been a particularly notable one in the history of Selection Trust for not only has the net profit, after charging taxation and all other expenses, risen by over six per cent to £1,886,584—a figure second only to that of the record year 1956/57 —but also the market value of the quoted investments has risen from £23,754,203 to £27,942,035. This increase is against a background of generally falling share prices of African investments and Selection Trust has 51 per cent of its investments in Africa.

This success is due in no small measure to the policy of diversification, in terms of both geographical and mineral distribution, that Selection Trust has followed. In his statement this year the chairman, Mr. A. Chester Beatty, has outlined the spread of interests and points to the fact that at present the company's assets are distributed in the following manner :—U.S.A. and Canada 43 per cent, Sierra Leone and Ghana 14 per cent, Northern and Southern Rhodesia 8 per cent, South-West Africa 14 per cent, Union of South Africa 15 per cent, United Kingdom 6 per cent. It is interesting to note the 49 per cent of the company's assets invested outside Africa provide only 37 per cent of the income. The higher return on the African investment is a recognition of the less stable conditions prevailing there.

Of Selection Trust's individual investments, the 12.4 per cent interest in American Metal Climax, currently valued at £20,000,000, is the most important. Last year was a record one for AMAX, its net income being 26 per cent higher than in 1959. This was mainly due to the rise in molybdenum earnings and again points to the value of the 1957 merger of American Metal and Climax Molybdenum.

The other main interest in base metals is through its direct holding of 14¼ per cent of Tsumeb Corporation, the South-West African lead-copper-zinc producer. Selection Trust's interests in diamonds is through a 37.5 per cent holding in CASTs, who also had a record year in 1960. Operations in Ghana yielded 1,280,000 cts. compared with 1,250,000 cts. in the previous year and in Sierra Leone output rose by 12 per cent to 702,000 cts. CAST's profit for the year rose to £1,605,000. Selection Trust's main gold shareholdings are in Vaal Reefs and Western Holdings.

Following his usual admirable practice of making a forecast of the current year's results Mr. A. Chester Beatty expects the net profit to show even further improvements. He has forecast that the dividend will be at least maintained. This is the first time that Mr. Chester Beatty has suggested that it will be "at least" maintained and in view of the higher profit levels it would not be unreasonable to interpret this qualification as pointing perhaps to an extra 1s.

UNION CORPORATION IN THE REPUBLIC

Sir Charles Hambro is the first chairman of a major mining finance house to address an annual meeting since South Africa became a republic. In his speech Sir Charles has expressed confidence in the ability of South Africans ultimately to solve their difficult problems but added that the country cannot really prosper unless steps are taken to restore the confidence of overseas investors in South African projects.

In terms of Union Corporation itself, the bulk of whose shares are held outside of South Africa, the chairman has said that it will be able to meet its commitments in terms of financing the new mines in the Kinross area without going through the medium of the Stock Exchange. This has been made possible through the negotiation of a short term loan of £2,000,000 and whilst it means that the rewards to the corporation, in the long term, will be high it does restrict the participation in any new project that might arise.

As suggested in these columns in our issue of May 12, the market value of Union Corporation's portfolio has fallen considerably since December last. At present the value of its quoted investments stands at £46,600,000.

SIAMESE TIN PRODUCTION AND SALES UP

The output of the Siamese Tin group increased by almost 60 per cent in 1960 as compared with 1959, the production for the year was 2,605 tons and the sales amounted to 2,735 tons. The increase in output is the result of the lifting of the export restrictions under the Interntional Tin Agreement which allowed the Syndicate to start the Huey Moot dredge.

This dredge was modernized in 1957/8 and is now digging in tough, fairly low grade ground. The chairman, Mr. W. R. B. Foster, has said in his statement that it should provide a steady, though modest profit in normal working years but unfortunately the production costs of this dredge, or any other for that matter, have not been given. These figures for a modern dredge working in a low grade area would have been particularly interesting.

The other modernized dredge, working at Bangnon, is in good tin bearing land and should give even better results in the current year as it was necessary, during 1960, to restrict its operations due to export allowances being exhausted. The two Bagrin dredges improved output in 1960 by 40 per cent compared with 1959, due not only to increased export allowances and better ground, but also to higher working efficiencies.

A final dividend for the year ended December 31, 1960, has been declared at 1s. 3d. per share bringing the total for the year to 2s. 9d. (less tax). The net profit before taxation for the year has increased from £182,036 to £577,014. However, the taxation figure has increased

London Market Highlights

On Monday of this week it looked very much as though the recent recovery in the Kaffir market had come to a full stop. A dull opening in Johannesburg deterred the few local and Continental buyers with the result that London jobbers who were embarrassingly short of shares took the opportunity to lower prices throughout the list.

But Johannesburg had a change of heart on Tuesday and this set in train a general improvement here which persisted up to the close of dealings on Wednesday. The reason for the latest upswing was the expectation—later confirmed — that South Africa's gold and foreign exchange reserves would show an improvement for the first time in 14 weeks.

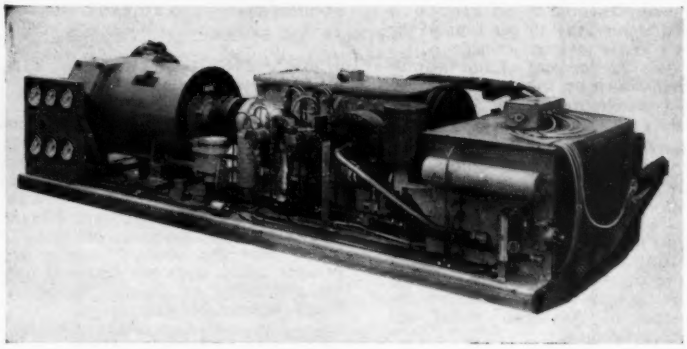
During a modest turnover, Western Holdings rallied from 117s. 6d. to 120s. 7½d., Free State Geduld improved 3s. 9d. to 91s. 3d. and Anglo American were similarly better at 131s. 3d. The appearance of the first of the June Kaffir dividends made little impact. The payments for the most part were much in line with expectations; the lower dividend from Buffelsfontein, for instance, was officially foreshadowed last year and the shares stayed a firm market at 38s.

An interesting development was the beginning of a cautious return of buying interest in the Northern Rhodesian copper group. This interest was allied to the firmness of the metal price and the knowledge that if Northern Rhodesia can find a reasonable answer to its problems, the copper share market will respond very sharply indeed. Among the modest price gains this week Nchanga moved up 1s. 3d. to 48s. 9d. partly on the view that a cut in the forthcoming final for the year ended on March 31 may not have to be made after all. Rhodesian Anglo gained 1s. 6d. to 58s. 9d. and a certain amount of call option buying was reported in Bancroft.

Tin once again provided the star turn in commodity markets. During the first three days of this week the price of cash metal advanced £11 5s. a ton to the Buffer Stock ceiling level of £880 and three month metal climbed £11 15s. to £887. Tin share prices made only a modest response to this at first, but gathered strength on Wednesday. Among many substantial gains, Ayer Hitam spurted 4s. to 46s. 3d., Tronoh advanced 3s. 3d. to 63s. 6d., while Southern Malayan (34s. 6d.) and Sungei Besi (43s. 9d.) each showed a rise of 3s. 6d.

Elsewhere, Beralt at 31s. gained 2s. 3d. in sympathy with the recovery that appears to be getting under way now in wolfram. Central Provinces Manganese, however, took a fresh plunge of 2s. 3d. to 18s. following the reduced dividend and the lack of news regarding the renewal of some of the Indian leases. Consolidated Zinc which tends to move with the Industrial market fell 2s. to 71s. in sympathy with the shake-out in that section, but later became steadier at around 71s. 9d.

THE ARMSTRONG AIRBREAKER SYSTEM . . .



- More Large Coal – Less Fines
- Greater Safety
- Operational Simplicity
- No Fumes or Smell
- Lower Cost

. . . For Blasting Coal with High Pressure Air

The Armstrong Airbreaker System represents a modern and versatile method with which coal (or other minerals) can be prepared for loading operations. It can be applied to Longwall, Room and Pillar and Steep Seam methods of working, and is equally effective in cut or uncut coal. The System comprises a compressor, pipeline and Armstrong blasting shells, through which the high pressure air is discharged to break out the coal.

OLIN MATHIESON LTD., EXPORT DEPT., 17-18 OLD BOND STREET, LONDON W.1

MAP OF THE GOLD MINES OF THE KINROSS AREA

Copies of this map, prepared by *The Technical Map Service* of Johannesburg, are now available in London. They show (as at November 1959):-

- the exact position of each mine on the field.
- where on each property boreholes have been sunk, and what has been the core recovery on reef intersection.
- what shafts are being sunk.

Accompanying this map is a small outline map, bringing the borehole results up-to-date as at October 1960.

★While a mine is at the development stage, it is of vital importance to have a visual picture of its position in relation to the field as a whole. Otherwise the quarterly results published by the companies lose much of their significance.

★Results reported from adjacent mines often have a direct bearing on the one in which you are interested, which, however, can only become apparent if you have clearly in mind the position of the properties in relation to one another.

Obtainable in London from

The Mining Journal

Price 25s. (plus 1s. postage)

WIGGLESWORTHS

for POWER TRANSMISSION EQUIPMENT

Makers of

"TEXROPE" V DRIVES

PROVED BEST BY BEST

FRANK WIGGLESWORTH & CO. LTD.

ENGINEERS

SHIPLEY YORKSHIRE

from £46,408 to £230,662. The proposed dividend together with those already paid have absorbed £184,069 and £167,000 has been transferred to reserve.

With regard to the current year, the chairman, in outlining the prospects for the various dredges, has not indicated that there will be a further substantial increase in output this year. The output to date (May 31) is 1,071 tons as compared with 1,051 tons for the same period of the previous year. When comparing the likely results of the current year with those of 1960 Siamese Tin is in a strong position, for the good results of 1960 are the result of an increase in production, not simply the sale of accumulated stocks, and thus 1961 results should be of the same order.

An interim dividend for the current year has been declared at 6d. per share (less tax). (See page 676.)

EX-LANDS "BONUS" DIVIDEND

Whilst the chairman, Mr. A. Hedley Williams has not described the 35 per cent dividend as being in any way a bonus declaration it must be regarded to some extent as such. Approximately one quarter of the tin sales revenue came from tin stocks carried forward from the previous year. Thus this portion of the revenue cannot be repeated and the chairman has warned that it is unlikely that the dividend will be maintained. The output for the year was 540 tons and this was supplemented by the sale of an aditional 144 tons from stocks. Tin stocks at the mine are now valued at £12,120 as compared with £43,644 at the close of 1959.

The increase in wages awarded to mine labourers towards the end of 1959 together with the general increase in the cost of stores and materials has resulted in an increase in the cost of production by almost 10 per cent—from £226 to £248. The chairman has warned that continuing wage demands are inevitable. This increase in costs will be offset during the current year by the higher price of tin. (See page 676.)

Output to date this year (up to May 31) has amounted to 213 tons compared with 219 tons for the same period of the previous year. This decline is not in itself significant though it does suggest that no minor increases in production by additional shift working are contemplated. This type of working is invariably uneconomic, but is occasionally justified with a very high commodity price. The ore reserves, whilst adequate for the present scale of operations, do not indicate that any large scale expansion plans could be considered.

LUCAS BLOCK FINANCE COMPANIES

The annual reports of Eastern Rand Extensions and Southern Van Ryn continue the story of falling South African share prices. Between December 31, 1959 and April 27 of this year the market value of the quoted investments of these two companies has fallen by over 30 per cent. The quoted investments of E.R.X. and Southern V.R. now stand at £1,248,020 and £1,336,928 respectively. This is obviously a disturbing situation but the directors have decided, in the circumstances, that it would be unwise to realize any of the assets at this stage and in fact have made further small investments in the producing mines.

Another set-back in the fortunes of these companies has been the reduction in dividend payments by Stilfontein and Hartebeestfontein. The result has been for E.R.X. that the income from dividends has fallen from £151,488 to £139,021. Southern Van Ryn's revenue from this item has also fallen but fortunately it has been more than off-set by a net profit on the realization of investments of £50,963. The bulk of this amount has been re-invested and £50,000 has been placed to General Reserve.

As was announced earlier, prospecting on the farms Video and Vermeulenskraal Noord in the Ventersburg district has been abandoned. The prospecting on the farms on the eastern boundary of the Lucas block has also been discontinued though option contracts over small areas have been retained.

Despite the drop in dividend income both companies have been able to maintain their dividend rates. In fact the Southern Van Ryn dividend has been fractionally increased from 7.0d. to 7.2d.

SELAYANG TIN

In his statement to shareholders the chairman, Mr. T. J. Bond, has announced that it is unlikely that dredging operations will be recommenced during the current financial year but it is hoped that by keeping the maintenance costs to a minimum they will be largely covered by the revenue from the processing of secondary ore and from tributors. During the past financial year ended September 30, 1960, the company showed a profit before taxation of £11,779. Provision has been made for taxation at £3,959, and dredge replacements at £3,000. The dividend payment of 20 per cent or 2.4d. per share, less tax, absorbed £5,359 leaving a slightly reduced balance of £23,438 on the appropriation account to be carried forward.

CAPITAL REPAYMENT BY HALKYN

With the price of lead at a consistantly low level it has not been possible for Halkyn District mines to resume lead mining. During the past year the revenue has been entirely from the sale of high grade limestone.

The board of directors has therefore decided that, as the liquid resources of the company are considerably more than that required for a limestone operation alone, a capital repayment of 1s. per unit of stock should be made to shareholders. This descision, subject to court approval, would return to shareholders £41,135. From the balance sheet as at December 31, 1960, this would still leave net current assets at £40,223.

Though the limestone mining operations showed a small loss during the past year, a dividend of 1s. per stock unit was paid. This was also in accordance with the general policy to reduce the liquid resources of the company.

The par value of the shares is 2s.

De Beers May Results.—At the Annual Meeting in Kimberley Mr H. F. Oppenheimer announced that the diamond sales for the first five months of 1961 amounted to £38,782,658 compared with £35,431,279 for the same period of the previous year. The figure for the March quarter was £24,302,251 representing an average of £8,100,000 per month for the first three months compared with £7,240,000 for the subsequent two months. Whilst this fall is probably due in part to the indigestion of the Amsterdam gem market it must also represent a fall in the sale of industrial stones. (See page 671.)

Zandpan Shaft Intersection.—The No. 1 vertical shaft has intersected the Vaal reef at a depth of 6,852 ft. Of the 17 sections sampled the average value was 29.34 dwt. per ton over a channel width of 5.18 in., equivalent to 152 in. dwt.

Tongkah Harbour Tin.—As from February 10, 1961, Tongkah Harbour became an Overseas Trade Corporation for income tax purposes. This follows the transfer of the company's residence to the United Kingdom. During the past three months the sea dredge has been transferred from the western portion of the sea leases to the southern central portion. The dredge is now digging northwards.

Swaziland Iron Ore Railway.—It has been announced in Johannesburg that the British Government has agreed in principle to the building of a 200 mile railway to link the Bomvu Ridge iron ore deposit with the Portuguese line to the port of Lourenco Marques. The cost of this line is estimated at £8,000,000. The iron ore is to be exported to a large Japanese steel combine which will buy up to 1,200,000 tons of ore annually for ten years from 1964. (See The Mining Journal, March 3, 1961.)

Gold and Base.—The preliminary results of Gold and Base Metal Mines of Nigeria show an increase in revenue from tin and columbite of almost 70 per cent. This additional revenue is mostly due to the additional tonnages exported rather than a higher unit price received and thus the Nigerian costs have risen in a similar proportion. The profit for the year after taxation has increased from £57,021 to £64,097. A dividend of 3d. per share (10 per cent) less tax. Meeting June 27, London.

East Rand Consolidated.—With the preliminary results for 1960 E.R.C. have announced a proposal to raise £300,000 by a rights issue of 3,000,000 shares of 2s. each at par. Shareholders will receive one for every two shares held at June 16, 1961. The additional funds are to be used to broaden the basis of the portfolio, to extinguish the existing overdraft and to provide adequate liquid resources for any special industrial opportunities which may be offered to the company. It is anticipated that the present rate of dividend will be maintained on the increased capital. Proposed dividend 2.4 per share less tax. Meeting July 20, London.

Kaduna Prospectors.—The preliminary results for Kaduna Prospectors show that the profit for the year ended December 31, 1960, has been increased, when compared with 1959, by over 30 per cent to £7,670. This is the result of the increased tin sales which have risen from 47 to 88 tons. A final dividend for the year has been recommended at 6d. per share which brings the total payment for the year to 9d. per share.

Meeting June 22, 1961, London.

Kaduna Syndicate.—During the year ended December 31, 1960, the tin sales increased from approximately 189 tons in 1959, to 313.5 tons. The net profit has increased as a result from £15,683 to £17,705. A final dividend of 4d. per share has been recommended bringing the total for the year to 7d. compared with 5d. for the previous year.

SOCIÉTÉ MINIÈRE DU BÉCÉKA

The Forty-First Annual General Meeting of the Société Minière du Bécéka was held on May 24, 1961. The following are translated extracts from the Directors' Report :—

The outbreak of violence following the declaration of independence in the Congo has painfully marked the Kasai province, which has been the scene of many tragic events. It is with sincere feeling that we shall remember the many victims of the population of the Bakwanga region. The welfare of these people has always been our concern.

It is with gratitude that we convey our thanks to the staff who have shown such devotion and courage in protecting our plant and equipment under very difficult conditions and have made it possible for us to restart our activities. Our company will continue to pursue its plans for economic expansion and social advancement.

Diamond Production

World sales in 1960 by the organizations which centralize the distribution of uncut gem and industrial diamonds, more particularly those emanating from African producers, amounted to £89,700,383 as against £91,135,943 (a record) in 1959.

The sales of gemstones have increased and are valued at £63,450,929 compared with £63,033,187 in 1959.

The decline in sales of industrial diamonds and boart — £26,249,454 against £28,102,756 in 1959—affects only the industrial diamond market as it had not been possible to negotiate further barter transactions with the U.S.A. (diamonds in exchange for agricultural surpluses) as had been the case during 1959.

Boart sales in particular, however, have shown a slight increase £10,974,233 compared with £10,363,854 in 1959, in spite of the recession in United States industry and the competition from synthetic diamonds. The price of boart has remained stable during the year under review and the consumer's needs have been filled punctually. Delivery of boart under the framework of the barter formula continues.

During the financial year under review, we have renewed our selling agreements for the years 1961 to 1965 and new conditions have been incorporated in the contract. These selling agreements have, since 1927, taken care of the distribution of diamonds and have protected the market against the fluctuations to which it is exposed by the very nature of the industry. They safeguard the stability of the market in the interest of both the diamond industry and commerce, and particularly of the countries where diamond mining is carried on.

The important industrial consumers of crushing boart, who rely on boart for their technical developments, cannot make use of larger amounts unless they are given the assurance of a regular and constant supply at a stable price which will enable them to stabilize their own cost levels. The Central Selling Organization must rely on the exact knowledge of the industry's needs and on the study and promotion of the use of diamonds in all the industrial spheres.

Prospecting

Prospecting surveys, which had been slowed down during the first half of 1960, were suspended in July, 1960.

In the Lubilash area, reserves declined during the year. Prospects for the future, however, are not affected.

An interesting deposit has been located in the Katska area and prospecting is still going on. A number of illegal operations have been noted in this area.

The geochemical survey in Entre Kanshi-Mudita has shown several anomalies and a check has been started by drilling and testing.

On the banks of the Luebo, the extentions of the alluvial deposits have kept pace with production. Preliminary aeromagnetic surveys have not resulted in any discovery of economic interest.

Personnel

As a result of political events and the subsequent suspension of work, a large number of European officials returned to Belgium in September. In October only about 30 volunteers remained in Bakwanga to safeguard and maintain the installations there. When work restarted, this team was relieved and the staff position has been reinforced progressively.

At December 31, 1960, the number of officials in the Lubilash sector was 110, 24 of whom were Africans. At the end of 1959 there were 194 officials, all Europeans.

EX-LANDS NIGERIA

The forty-ninth annual general meeting of The Ex-Lands Nigeria, Ltd., was held on June 6, in London.

Mr. A. Hedley Williams, M.I.M.M., M.Inst.Pt., presided, and the following is an extract from his Statement circulated with the Report and Accounts for the year ended December 31, 1960 :—

After slightly increased quotas for the export of Tin for the first three-quarters of the year, it was decided by International Agreement to suspend for the time being restriction of outputs and embargoes on shipments as from October 1, 1960. As a consequence, we were permitted to ship the "frozen" stocks on the Mine. The declared output for the year was 540 tons concentrates and this was supplemented by the shipment of an additional 144 tons.

Net Tin revenue aggregated £386,488, giving an average of £794 per ton metal. Expenditure on the Mine and in London, including realization charges, aggregated £219,793. Royalty paid to the Nigerian Government amounted to £55,878. This left a profit of £112,890. Taxation absorbed £50,000, and special prospecting expenditure written off amounted to £2,457.

After due consideration, the Board feel that some part of the benefit derived from the shipment of Tin mined in previous years and held in stock should now be passed to members and they have decided to recommend that the dividend for the year be increased to 35%, less tax. This will leave £63,466 to be carried forward.

The report and accounts were adopted.

SIAMESE TIN SYNDICATE

SALES AGAIN INCREASED

The fifty-fourth annual general meeting of the Siamese Tin Syndicate, Ltd., will be held on June 29 in London.

The following is an extract from the statement of the Chairman, **Mr. W. R. B. Foster,** circulated with the report and accounts for 1960 :—

The production of the group for the year was 2,605 tons of tin concentrates; this was 972 tons more than in the previous year and 1,096 tons more than in 1958. As restriction on exports (and hence on production) was in force at varying rates from December, 1957, until September, 1960, no true comparison can be made of annual outputs for the last few years. For the same reason production costs have again been omitted though we have been able to include statistics which we felt would be of interest to stockholders.

Sales of tin concentrates totalled 2,735 tons, an increase of 972 tons over the previous year. The average Singapore tin market price for 1960 was a little under the 1959 figure, but as deductions (at £33 per ton of concentrate) to cover Thailand's Buffer Stock contributions ceased in April, the average net price we received for our product was higher than in the previous period.

Mainly as a result of the increased production, our profits have risen considerably and after the recent lean years it is a pleasure to be able to recommend the payment of a final dividend of 1s. 3d. per stock unit, making 2s. 9d. per stock unit for the year.

International Tin Agreement

A new Agreement has been made and, subject to ratification by member Governments, comes into force on July 1, 1961. All the producing countries which participated in the recent scheme are expected to rejoin, and on the consuming side the numbers will probably increase.

A Buffer Stock is an essential part of all the tin control agreements, but complications arise when producer countries' contributions are due to be disbursed at the end of an old scheme and fresh cash is required to finance a new one. In relation to the expiring agreement a distribution of cash has been approved by the Malayan Government after consultation with the industry; in Thailand, the Association of British Mines and the Mining Industry Association of Thailand have been meeting with Government officials, but no decision has yet been reached. Whatever the result, however, we shall be called upon in both Malaya and Thailand to make a net additional contribution towards the financing of the new buffer stock.

At the time of writing, the statistical position of tin promises well for producers and there is a possibility that supplies of metal (including those in the Buffer Stock) may fall short of requirements. While this outlook remains, reflected meanwhile in a higher tin price, restrictions on exports from producing countries are unlikely to be imposed and none in fact have been in force since September 30, 1960.